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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Hexyl Resorcinol Judgment

AFTER protracted hearings of the action brought by Sharpe and Dohme, Inc., against Boots Pure Drug Co., Ltd., to establish the validity of their patent, No. 219,922, relating to improvements in or relating to the manufacture of alkyl resorcinols, two Courts have now decided against the validity of the patent, and it remains to be seen whether, in the face of these judgments, the issue will be carried to the House of Lords. After a hearing that lasted 17 days in the King's Bench Division, Mr. Justice Astbury held that the patent was invalid for want of novelty and subject matter, and dismissed the action for infringement. After a hearing lasting 19 days, the Court of Appeal (consisting of the Master of the Rolls and Lords Justices Sargant and Lawrence) has unanimously confirmed Mr. Justice Astbury's judgment and dismissed the plaintiff's appeal from it.

Although one must keep in mind the possibility of the appeal being taken further, it is permissible to draw attention to the findings up to now. The view of the Court of Appeal, as stated by the Master of the Rolls, is that the vital claims in the specification are invalid for want of novelty, and that, on the issue of subject matter, no inventive step was taken, but only verification of previous researches, coupled with the

ordinary skill that a chemist might be expected to provide and apply.

The facts, as so far disclosed, are comparatively simple. Two American biochemists, in order to investigate the relation of antiseptic properties to chemical constitution, prepared the alkyl resorcinols up to *n*-butyl and plotted the antiseptic properties against the weight of the alkyl chain; they indicated that the method of preparation, which they had evolved after an exhaustive study of the literature, was of general application, and that there was a definite relationship between antiseptic properties and the length of the alkyl chain. The patent in suit was subsequently taken out by the plaintiffs for all alkyl resorcinols except those specifically described by the American workers, and the *iso*-butyl, *iso*- and *n*-amyl, and *n*-hexyl resorcinols alone were specifically described and claimed. It was agreed that none of the last four bodies had been actually prepared and described before in the literature, but the essential question was whether invention was required to make them and all the rest of the homologues.

Much of the evidence was directed to the issue as to what does or does not constitute chemical research. Both Courts have held in effect that invention is not required to carry a few stages further in a homologous series a reaction which has, for the lower stages, proceeded without any indication of a hitch. This is, in effect, the interpretation of research that was given by the chemical witnesses on behalf of the defendants.

"Research" is a word which is often loosely used. An advanced student engaged in a piece of fairly obvious investigation may regard his work as research, and the desire for publication of details that may find their way into Beilstein may lead to other misuse of the term. Is there any teacher of chemistry who has not frequently told a student to make some preparation which is not to be found specifically mentioned in the immediately available literature? Such a student may, in the present loose use of the word, be pardoned for thinking he is engaged on research, although he would be quite wrong.

Many chemists, we believe, will feel that if a patent of the nature in question were upheld, the progress of investigation might be seriously hindered. There is an unwritten convention that investigators do not trespass on one another's fields of work, and on this assumption early publication of useful work is facilitated, to the great advancement of scientific knowledge and for the guidance of workers in analogous fields, but if a man's work becomes liable in effect to be made the subject of another's patent, so that his own field is barred to him, scientific publication must be considerably hampered.

The question of chemical patents is notoriously fraught with difficulties; but generally it may be taken that a patent monopoly is given for a period to

an inventor as a reward for his invention and as an encouragement to further invention, to the ultimate benefit of the community, but one can understand researchers being concerned at the prospect of a monopoly being so freely granted for all the members of a homologous series, as in the case in point. Chemical progress might be impeded by such wholesale patents, and research laboratories might have their opportunities for constructive invention seriously curtailed.

Power Costs in Chemical Industry

THE presidential address delivered by Sir Alexander Gibb at the meeting of the Institution of Chemical Engineers, on "The Economics of Power as Applied to Chemical Engineering," dealt in a very stimulating way with a subject which, while often and anxiously considered, has rarely been dealt with in such a broad and comprehensive way. In particular, Sir Alexander discussed the position of cheap power as an essential part of electro-chemical and electro-metallurgical processes. From the facts adduced in the address, it appears that while at present our available power may fall short somewhat of the requirements of industries depending on cheap power, we are not at such a severe economic disadvantage in regard to power from steam, as compared to countries having considerable water power, as might be expected. Future developments, especially in the direction of higher pressures and temperatures, will increase the efficiency of the generation of electricity from steam, thus helping to redress the balance as between steam and water power. It therefore seems that there may be distinct possibilities of economies in the direction of electrical power in the future. Cheap power, however, is only one factor, for the significant point was made in the address that even with the cheapest power in the world, the arc process for the fixation of nitrogen was practically dead. Apart from everything else, the presidential address was of importance in that it indicated yet another branch of industry—electro-chemical engineering—to which aspiring chemists may turn their attention.

At the annual dinner, Sir William Alexander, in a speech singularly packed with suggestion and counsel, also emphasised the importance of the costs sheet as the final court of appeal for both chemical engineer and employer, and quoted Quinan's *Study for the Manufacture of Phosgene* as indicating the ideal method of carrying a chemical reaction through its various stages to large scale production. Perhaps even more impressive was the catalogue of industrial fields awaiting exploitation by the chemical engineer and the list of problems still unsolved or only partly solved. For the chemical engineer, indeed, who had almost to apologise for his existence only a few years back, the opportunities for service to-day present an embarrassing choice in their variety and importance. The papers discussed at the meeting were all of interest and importance, but perhaps the outstanding one was that of Dr. Spengler on the treatment of beet sugar effluents. This problem has been receiving careful consideration in this country, and nothing but good can come from such a visit by a distinguished foreign chemist, who generously offered the fruits of his own considerable experience

towards the general fund of knowledge. It is clear that the problem of beet sugar effluents is not yet completely solved, but very encouraging progress has been made.

Still Improving Trade Returns

THE Board of Trade returns for February fully confirm the previous indications of a steadily growing volume of overseas trade. Both the national figures and the chemical figures reveal the same satisfactory features—a reduction in imports and an increase in both exports and re-exports. Comparing the returns of chemicals, drugs, dyes and colours for February of this year with February of 1927, imports have declined £43,261, exports have increased £301,543, and re-exports have increased £7,945. It is the more reassuring that this obvious recovery of trade is gradual and progressive, and moreover covers most of the branches of chemical industry. Already it has produced a much improved tone, and with increasing security against industrial disturbance the movement of trade should be further accelerated. The leaders of chemical industry can themselves help by a show of real confidence in the future.

Death of the Editor of "The Gas World"

WE have to announce with deep regret the death, which took place on Thursday morning, of Mr. Peter Robertson, editor of *The Gas World*. Mr. Robertson had been associated with the journal for the greater part of his life, and found his chief interest in life in his service of the gas industry and of his paper. He had been confined to his home for some time before his death. The funeral will take place on Monday afternoon at Norwood Crematorium.

The Calendar

Mar.		
19	Artificial Silk Goods Exhibition.	Holland Pk., London.
19	Chemical Industry Club: "Industry in Soviet Russia." A. J. Underwood. 8 p.m.	2, Whitehall Court, London, S.W.1.
20	Royal Photographic Society: "Photography and Photometry in X-Ray Crystal Analysis." W. T. Astbury 7 p.m.	35, Russell Square, London
20	Institute of Metals (Birmingham Section): "Non-Ferrous Tubes." W. E. Ballard. 7 p.m.	Engineers' Club, Birmingham.
21	Society of Glass Technology.	Leeds.
22	Institute of Chemistry and Society of Chemical Industry (Edinburgh): "Recent Advances in the Chemistry of Soils." Dr. W. T. H. Williamson. 8 p.m.	36, York Place, Edinburgh.
22	Chemical Society: Anniversary Dinner. 7 p.m.	Hotel Victoria, London.
22	Society of Chemical Industry (Edinburgh Section): Annual General Meeting. 7.30 p.m.	36, York Place, Edinburgh.
22	Chemical Society: Annual General Meeting. "Constitution of Liquids. Some New Experiments." Professor H. Brereton Baker. 4 p.m.	Burlington House, Piccadilly, London.
23	Society of Chemical Industry (Glasgow Section): Annual Business Meeting. 7 p.m.	39, Elmbank Crescent, Glasgow.
23	Chemical Engineering Group: "The Mechanism of Fractionating Columns." Professor E. C. Williams.	Burlington House, London.
23	Society of Dyers and Colourists (Scottish Section): "Some Features of the Swelling and Solution of Cellulose." A. J. Hall.	
27	Institution of Petroleum Technologists: Annual Meeting. 5.30 p.m.	Royal Society of Arts House, London.

Annual Meeting of the Institution of Chemical Engineers

Economics of Power in Chemical Engineering

The annual meeting of the Institution of Chemical Engineers, held on Thursday and Friday, March 8 and 9, at the New Princes' Restaurant, London, was the occasion of the communication and discussion of papers on subjects as various as magnetic separation, powdered fuel, power economics in chemical engineering, and beet sugar effluents. Below is given an account of the proceedings.

The Presidential Address

At the annual general meeting of the Institution on Friday, Sir Alexander Gibb, who was re-elected president, delivered his presidential address, entitled "The Economics of Power as Applied to Chemical Engineering," and discussed the position of cheap power as an essential part of electro-chemical and electro-metallurgical processes. With the development of cheap power, he said there had been a phenomenal development of certain industries making use of electrical power in large quantities, because economically produced power was a *sine qua non* of the electro-chemical industry. The consumption of electricity in electro-chemical processes naturally varied enormously, ranging from a few kilowatt-hours per ton of one particular commodity produced to several kilowatt-years for another. With the former the cost of the power was a bagatelle, whereas with the latter it was a vital factor, and the latter only were included in the term "cheap power industries." The following list of the more important cheap power industries gave an idea of their demands on electricity, excluding the requirements for heat, light, transport, communication, and other such services.

Cheap Power Industries.

Hydrogen Gas	1,600 kilowatt-hours per 1,000 c. ft. produced.		
Pulp and Paper	1,800-2,000 kilowatt-hours per ton produced.		
Pig Iron.....	2,000 to 3,000	"	"
Refined Iron (from pig iron) ..	1,500 to 2,500	"	"
Electrolytic Zinc	3,800 to 4,000	"	"
Calcium Carbide.....	4,000 to 4,500	"	"
Caustic Soda	4,500	"	"
Nitrogen (Direct Synthetic Process)	5,000	"	"

Various Ferro-alloys	5,000 to 15,000 kilowatt-hours per ton produced, and even more (the highest being for a high percentage Ferro-Silicon).
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Potassium and Sodium Chlorates	6,000 to 8,000 kilowatt-hours per ton produced.
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(For sodium perchlorate we may add a further 3,000 kilowatt hours).

Phosphorus	11,000 to 13,000	"	"	"
Sodium	14,000 to 15,000	"	"	"
Magnesium	18,000 to 20,000	"	"	"
Nitrogen (Cyanamide Process)	20,000	"	"	"
Aluminium	25,000	"	"	"
Nitrogen (Arc Process) at least	80,000	"	"	"

Power Costs in Nitrogen Fixation

Taking the three proved processes of nitrogen fixation, it was pointed out that the arc process now obtained almost solely in Norway. The efficiency of this method was extraordinarily low. At 0.1d. per unit the amount of electricity required was so great that it would be quite impossible to compete with other processes. The economic price for electricity for the arc process would appear to be certainly below 0.075d. per unit. The cyanamide process required approximately one-quarter the electrical energy of the arc process, but was still definitely a cheap power industry, dependent almost wholly on water power. The direct synthetic process required something like a sixteenth of the power used in the arc process, and for this reason and owing to the fact that auxiliary use could be made of the exhaust steam, the synthetic process was entirely independent of water power. Comparing the present and pre-war positions of the three



CHEMICAL ENGINEERS AT DINNER.

processes, Sir Alexander gave the figures in the following table:—

WORLD PRODUCTION OF FIXED NITROGEN OTHER THAN IN CHILEAN NITRATE AND BY-PRODUCT AMMONIA.			
Arc Process	...	1913	7 plants producing 19,800 tons, being 31.7 per cent. of total synthetic nitrogen.
		1926	7 plants producing 40,500 tons, being 5.5 per cent. of total synthetic nitrogen.
Cyanamide Process	1913	15 plants producing 36,000 tons, being 57.4 per cent. of total synthetic nitrogen.
		1926	28 plants producing 174,000 tons, being 23.7 per cent. of total synthetic nitrogen.
Direct Synthetic Process	1913	1 plant producing 6,800 tons, being 10.9 per cent. of total synthetic nitrogen.
		1926	49 plants producing 519,000 tons, being 70.8 per cent. of total synthetic nitrogen.

Even with the cheapest power in the world the arc process was practically dead and the cyanamide process was possibly already obsolescent.

As regards hydro-electric power, it could be taken that 0.07d. to 0.145d. were the outside limits of the cost of power delivered to a nearby factory in favourable and average conditions in typical cheap power countries. In this country, we had very few hydro-electric installations already developed, the only outstanding one being the combined Kinlochleven and Lochaber developments of the British Aluminium Co., the final stage of which was not yet completed. We should be over-sanguine to hope for any hydro-electric power plant in this country capable of producing at 0.125d. per unit. Indeed, we were not likely to be able to get water power in present circumstances in this country at much less than 0.16d. per unit.

Steam Power

With our coal resources the margin between steam power and water power was much less now than formerly. With a 50 per cent. load factor, electricity was being generated on a large scale at a switchboard cost of about 0.275 of a penny per unit, and he was confident that a modern 100,000 k.w. steam power station in the most favourable circumstances could be built to produce electricity on the basis of a 100 per cent. load factor at 0.185d. per unit at the switchboard. In a year or two the figure would be 0.175d.

Moreover, the efficiency of the generation of electricity by steam was still comparatively low, and there was a corresponding opportunity for improvement, chiefly in the direction of higher pressures and higher temperatures. A modern steam power station, then, was already able to compete, on a 100 per cent. load factor basis, with a hydro-electric installation costing anything more than £65 per k.w. of capacity. As the load factor fell, so the advantage of the steam power station became greater, and at about 50 per cent. only really cheap water power could compete. When the best, however, had been made of our position it might appear that this country at the present time (apart from our Colonies and overseas possessions), fell short of the requirements of the cheap power industries.

The Outlook

If the matter ended there, the outlook for us in many of these electro-chemical industries would not be encouraging. Fortunately there were other considerations. The more one considered the history of these cheap power industries, the more one must come to the conclusion that cheap power had been allowed to play a somewhat disproportionate part in their development. It was a fact that, in some of the most important electro-chemical industries, processes were almost exactly the same as they were thirty years ago, and entailed an uneconomic use of electricity. The profusion of cheap electricity had, indeed, to some extent been a disadvantage in that it had tended to remove the incentive to research and invention which economic factors would otherwise have forced. Here in this country we could hardly hope ever to have ultra-cheap hydro-electric power, but that should really be an encouragement to us. *Res angusta domi* was a useful spur to effort, and there were countervailing advantages and ways by which apparent disadvantages could be turned to profit by ingenuity. If electro-chemistry failed to advance, pure chemical methods would have increasing successes at its expense.

The Theory of Magnetic Separation

The first paper read at the conference was "The Theory of Magnetic Separation," by Professor B. W. Holman, on Thursday, March 8. The chair was occupied by Mr. W. A. S. Calder. This paper was a collection of notes on those parts of the theory of magnetism which Professor Holman had found useful in connection with magnetic separation tests. Some theories of magnetism were reviewed, and magnetic attraction, particle size, shape of pole pieces, flux meters, electro-magnets, permeability determinations and separator design were discussed. The most desirable of all future developments, the drastic reduction of first cost for a given tonnage of finely crushed material treated, did not seem to be appreciably nearer.

The new magnetic separator recently perfected by the Mond Nickel Co. seemed to have solved the question of cheap treatment of lump material; also a distinct advance in the treatment of fine material was marked by the invention of the magnetic grid by Dr. Stafford Hatfield, and of the almost knife-edged poles of the Davies Non-entraining Separator, which were further ingenious applications of the attraction principle. The author felt that the most important future developments lay in the direction of improved magnetic repulsion separators.

In the subsequent discussion, Professor J. W. Hinchley said that from his experience of magnetic separation he had been very much struck on several occasions with the fact that the machines available on the market worked better when they were altered from their original design, and that by getting entirely away from the theory of the subject very much better results had been obtained. For example, in the case of leucite, a mineral which was ground down to a fineness of about 1 mm. size, it had been stated by a German firm of magnetic separator manufacturers that this was incapable of magnetic separation, but with a machine of the Wetherill type in which the usual lower magnet was done away with, there was no difficulty. Mr. A. Davies dealt with the difficulties arising out of entrainment in the magnetic fields, claiming that they were overcome in his own design of machine.

The Combustion of Powdered Coal

At the evening session on March 8, Dr. B. Moore dealt with work which he had done on "The Combustion of Powdered Coal."

The president, who was in the chair, said that the use of powdered fuel was coming more and more into use for engines, especially as rivals to the Diesel engine, and it was by such work as the author's that this country would be helped in its struggle with foreign opponents.

It had been found, said Dr. Moore, that the degree of fineness of the fuel particles had a considerable effect on the rate of combustion, the ignition properties, and the combustible capacities. There seemed to be a "critical" temperature and a "critical" degree of fineness at which the combustion of the particles become nearly instantaneous. This temperature corresponded with the glow point temperature as determined by a method described in the paper. The use of charges of the "critical" degree of fineness and excess air at the "critical" temperature should ensure, theoretically, efficient combustion.

The changes in the ignition and combustion properties did not depend merely on the surface area of the particles but were related to their constitutions, which might vary during a pulverising process.

Dr. Lessing's Views

A very animated discussion followed this paper. Dr. R. Lessing said that the problems of powdered fuel, difficult though they were, were less difficult than those of coal in masses, since the phenomena of oxidation, ignition and combustion were dissociated from each other. The limits for practical working as regards the size of powdered fuel were much wider than those stated in the paper. The distribution of the various coal components throughout the mass of the coal was of importance. With regard to the mineral matter, he thought that in order to attack the fundamentals of the whole problem it was necessary to avoid the use of commercial coal samples as obtained, and instead to separate the individual components in the first instance. Mr. E. F. Greig, of the

Safety in Mines Research Board, asked for more information with regard to the measurements of the specific surface of a particle. This was a very difficult problem, and he had been unable to get concordant results in his own work on this subject. He drew an analogy between the grinding of coal and the cold working of metals, since the nature of the materials was changed in both cases.

Mr. A. L. Godbert said that at the Safety in Mines Research Station it had been found that the inflammability of coal dust was directly proportional to its specific surface. Relations had also been found between inflammability on the one hand, and content of volatile matter and reactivity of the coal, respectively, on the other. Professor Holman thought that the author had neglected the surface energy of the coal, and cited instances from his own experience of the importance which might be assumed by this factor.

Treatment of Beet-Sugar Effluents

At the final session of the meeting, on Friday, March 9, the president being in the chair, Dr. O. Spengler, director of Institute of the Sugar Industry, Berlin, read a paper on "The Treatment of Beet-Sugar Factory Effluents." He said that the most objectionable effluents, with regard to the damage caused by them on direct discharge into a river, were those containing a considerable amount of dissolved organic matter. From this point of view, the diffusion and pulp press waste water was the most dangerous. Although the problem of disposing of these effluents was not completely solved, it was clear from the speaker's remarks that in Germany a solution was being devised. It was emphasised that there was not yet a general effluent purification process which could be applied to all factories, but that the particular process to be adopted depended entirely on local conditions.

As regards treatment of the pulp press and diffusion waste water, one of the latest methods of treatment was the Hildesheim double fermentation process. In this the hot effluents were depulped, and allowed to settle in a pond, where auto-fermentation occurred. On passage to a second pond, where 80-90 per cent. of the acid was neutralised with lime, the lime sludge settled and a second fermentation took place. From the second pond the water overflowed to a third, where the last fermentation occurred. This method had been tried, with good results, in German factories last year.

Work of the Department of Scientific and Industrial Research

Dr. H. T. Calvert (of the Department of Scientific and Industrial Research and the Water Pollution Committee), who opened the discussion, raised the question of using a system which avoided altogether the production of diffusion and pulp press water, and said that at several factories in this country such a process had been installed. The Department of Scientific and Industrial Research had conducted an experiment at one of the large sugar factories with a view to affecting the decomposition of sugar liquids by means of aerobic fermentation on so-called biological filters, and the results of the investigation would shortly be available. The importance of avoiding the production of effluent was also stressed by Mr. J. H. Garner (of the West Riding Rivers Board), who stated that the adoption in this country of a continuous diffusion process such as the Raabe diffuser had entirely avoided the production of diffusion and pulp press waters. He was of the opinion that insufficient attention had been given to the selection of sites. Some factories close to towns, on the up-stream side, would not have passed their effluents through the town if they had been erected on the down-stream side. Dr. J. B. Firth asked for information as to the required dilution of crude effluent which would obviate the danger of river pollution, and also discussed the bio-eration filter treatment. Mr. A. J. V. Underwood dealt with the question of settling ponds.

Dr. Spengler, who intimated that he would reply more fully to the discussion in writing, said that there were about 250 factories in Germany, and only 17 used the continuous diffusion process. He agreed with the suggestion that scientific control must be applied to the factories, and he was sorry to say that more could be done in that direction by the German factories.

The Institution Annual Dinner

A Jolly Gathering

THE annual dinner of the Institution, at the New Prince's Restaurant on Friday evening, presided over by Sir Alexander Gibb, was a particularly jolly gathering. The guests included the German Ambassador (Dr. Sthamer), Sir William Alexander, M.P., Dr. Spengler (director of the Sugar Industry Institute in Berlin), Sir Hugh Bell, and many others.

In proposing the toast of "The Institution," Sir William Alexander admirably summed up the qualities, functions and opportunities of the chemical engineer in a speech which is reproduced on p. 240. The President, in replying, extended a cordial welcome to the German representatives, and speaking of the Institution, claimed that chemical engineers must be classed amongst the basic forms of engineering, to rank side by side with civil, mechanical, electrical, and mining and metallurgical engineers and shipbuilders.

Mr. Arthur Reavell was in his gayest mood in proposing "Kindred Institutions," but among his serious suggestions was one that the great scientific institutions would one day be united together, and that in such a combination chemical engineers would hold no small place. Mr. Pendred was no less happy in his reply.

Sir Arthur Duckham's American Experiences

Proposing "The Guests," Sir Arthur Duckham, among his many jokes and stories, mentioned two interesting points out of recent American experience. At the wonderful Du Pont plant he saw millions of gallons of pure alcohol being turned out at the rate of 20,000 or 30,000 gallons per day in plant so well designed that there was not a smell of alcohol in the whole building. This went away to be mixed with nicotine, kerosene and other things known as denaturants. An American workman was now in the employ of his firm for some special bricklaying work, and received £80 a month. This man reported to him that workmen in England on exactly the same type of job were able to lay as many c. ft. of brick-work per day as the best workmen in America.

The German Ambassador

The German Ambassador (Dr. Friedrich Sthamer), replying in English, said that the Germans had shown the keenest interest in the production of beet sugar, and were watching recent developments in England with the greatest interest and sympathy. If the Germans from their experience could further this development in any way they would be only too pleased to do so. It was an excellent thing for the experts of different nations to meet and discuss matters of mutual interest and seek a solution of them. Nothing was more helpful for the creation of mutual ties than that experts should meet and co-operate successfully, and it was a happy idea on the part of the Institution to ask Dr. Spengler to give his paper before the Institution. He would be extremely happy if this exchange of ideas with the Continent could be expanded to other domains, because Germany would welcome every opportunity of bringing her engineers and scholars into contact with Great Britain, as it gave them an opportunity to learn from this country. Sir Hugh Bell also replied in a humorous speech in which he remarked that his long life had been largely spent in preventing experts from ruining him, although he could not say that he had been particularly successful.

Some very good music was supplied by Mr. Robert Easton, whose wonderful voice was revealed in several well-known bass songs, and Miss Betty Bannerman, whose singing of old folk-songs was quite charming. Miss Bessie Kiek was the accompanist. The proceedings ended with "Auld Lang Syne," Sir Alexander Gibb gallantly undertaking the solo. The arrangements, both for the conference and for the dinner, were as admirable as usual.

Beit Fellowships for Scientific Research

NOTICE is given that the fifteenth election of Fellows to Beit Fellowships will take place on or about July 16, 1928. Applications must be received on or before April 20 and only those under the age of 25 on the date of election are eligible. Forms of application and all information may be obtained by letter addressed to the Rector, Imperial College, South Kensington, London, S.W.7.

The Qualities and Functions of the Chemical Engineer

By Brig.-General Sir William Alexander, M.P., D.S.O., etc.

One of the features of the annual dinner of the Institution of Chemical Engineers on Friday was the speech of Sir William Alexander, M.P., in proposing the toast of "The Institution." It was so exact and comprehensive a statement of the qualities a chemical engineer should possess, and of the many new spheres of chemical industry open to him, that the substance of it is published separately below.

WHAT is a chemical engineer? I take it he is a different creation from an engineering chemist, and that gives us a clue to his essential nature. The chemist I know, and the engineer is among my friends. I look to the chemist to provide me with my foundation, with my reaction, in fact with the *bread* of my business. I look to the engineer to magnify my essential reaction to proportions not only imposing but profitable—he has to provide me with my *butter*. Dare I look to the chemical engineer, embodying as he should the strong points of both, to provide me with my *jam*?

In the past, an interview with the chemist has been succeeded by an interview with the engineer, and each has been conscious of the other's imperfections. May I really look forward to a time when instead of seeing two people I shall see one only, so leading to a reversal of accepted practice on convivial occasions such as the present?

I see that at one stage in your development you attempted a definition of the chemical engineer. That definition was later withdrawn, and I think rightly. You cannot define vital things, and the existence of the chemical engineer is vital to the progress of chemical industry. My advice to you is to classify yourselves in the hierarchy of professional men, not by definition but by performance.

What is Expected of the Chemical Engineer

What should be the nature of this performance? Forgive me if I dwell on this for a minute or two as a man who has been through the mill, who has spent forty-eight hours at a stretch many times on a plant and has been spared none of the hardships of apprenticeship; who in later days added to this kind of experience that of directing the work of technical industry seething with problems of the kind which are your daily portion.

Performance should have its roots in the research laboratory. I do not mean that the chemical engineer should himself carry out the research work, for life is short, but that he should see how a reaction or a process is worked out and established, and become thoroughly familiar with each and every step on the small scale—not only with each step as finally settled, but with the mishaps, the precautions to be taken, the criterion of success, and so on. Too often have I seen works recipes issued which were nothing but laboratory preparations, in which grams became pounds or hundred-weights and cubic centimetres gallons, with no reference made to the effect of mass, omitted because unknown.

The chemical engineer is he who can take these laboratory processes, increase the scale of production by designing the most efficient size of plant units, and repeat the reactions with all their delicacy and control, and approximate to the yield on the small scale. I say "approximate" because high yields can often be obtained at too high a cost, and the final court of appeal for the chemical engineer and the employer is the costs sheet. There are processes, in a minority class I fear, where large scale results are an improvement on those of the laboratory, but such must be looked upon as a bonus from the gods.

What the War Years Revealed.

The war years revealed very plainly the gap between the laboratory and the works, between the chemist and the engineer—a gap which it is your high function to span. One of the most brilliant exponents of chemical engineering I have known is Mr. K. B. Quinan, whom with sane instinct you have elected one of your first vice-presidents. His approach to any problem of chemical manufacture has always been the same—he went right back to the basic chemical equation, which he did not hold to be complete until the heat relationship had been inserted. "Take faithful care of 'little Johnnie Calorie,'" he would say, "and you may hope to solve the problem." I can think of no better training and discipline for the budding chemical engineer than a close study of such publications as Quinan's *Study for the Manufacture of Phosgene*,

which was wisely made available after the war. There you will find in what detail and with what thoroughness a chemical reaction was studied on its way to becoming a large scale process. For such achievement a knowledge of the multiplication table alone is not sufficient.

The chemical engineer has to pursue a general profession in a particular atmosphere, which is something bigger and other than what is termed specialisation, which may be very narrow. All his gifts and knowledge will find scope if his attitude to the problem is the right one, and the attitude will be largely determined by the nature of his training.

No degree in chemistry or in engineering, however brilliant, must be considered by the holder to be sufficient qualification for the exacting profession of chemical engineering. It is at the best but a certificate of faithful preparation. A degree must also be taken in the rough school of the workshops, of the works laboratory, of the manufacturing plant. The more it can go hand in hand with the training of the lecture room the better. I know it is difficult, and long vacations may have to be curtailed, but it is abundantly worth while. The student who can add to this a practical knowledge of French and German need have no fear that his profession will prove an ungenerous mistress.

Fertile Fields Awaiting Cultivation.

Finally, may I indicate one or two fertile fields for cultivation by chemical engineers?

The field of organic solvents for cellulose lacquers is still in its infancy. The chemical curiosities and rarities of yesterday are becoming the bulk product of to-day, and to-morrow will see other and greater demands. The higher alcohols, the esters of acetic acid, such as butyl and amyl acetates, the esters of phthalic acid, products such as diacetone alcohol and the glycol ethers, all require to be made in this country, to be made well by continuous and economical processes. The methods of preparation are known, but call for adaptation to industrial needs.

The elimination of waste is another field not yet covered. The scrubbing of gases in a small plant of low cost and of high efficiency has still to be achieved. Cognate problems are the recovery of solvents and the dehydration of tar without decomposition.

There is the field of liquid fuels obtained by synthesis or by hydrogenation—problems much worked at but not yet satisfactorily solved. These call for all the imagination, the skill, the tenacity and the patience which chemical engineers possess.

The field of low temperature carbonisation is clearly one for the chemical engineer, and a rich harvest awaits him who can devise a plant of low capital cost—sturdy, cheap, and continuous in action—giving either domestic or industrial smokeless fuel and by-products as yet unexploited. The field of synthetic fibres is not yet exhausted, nor is that of synthetic nitrogen products.

It is good to know that a new profession is not handicapped at the outset by want of opportunities for service. I rejoice that your institution bears all the marks of health—a lively activity shown in your papers and discussions; growth, for the membership of 81 in 1922 has become one of 475 in 1928; and a hopeful and resolute outlook.

I have been looking at the beautifully designed seal you have adopted for your institution. I note the pure waters issuing from the chemical and engineering springs and uniting to keep green and fertile the tree of knowledge, one of whose wide-spreading branches is chemical engineering. This is true symbolism.

Your high function is to combine these two streams, to be builders of aqueducts so that the desert may blossom as the rose, of bridges so that the dividing chasm may become a high road of industrial prosperity. Pontifex, the bridge builder, is a good name for the chemical engineer. I pray that you may never become pontifical.

Hexyl Resorcinol Patent Case

Appeal Dismissed with Costs

JUDGMENT was given on Friday, February 9, by the Court of Appeal (the Master of the Rolls (Lord Hanworth) and Lords Justices Sargant and Lawrence) in the appeal of Sharpe and Dohme Inc., against the judgment given in July last by Mr. Justice Astbury, in their action against Boots Pure Drug Co., Ltd.

Sir Arthur Colefax, K.C., the Hon. Stafford Cripps, K.C., and Mr. L. F. Heald (instructed by Messrs. Ravenscroft, Woodward and Co.) appeared for the plaintiffs (appellants) and Mr. James Whitehead, K.C., Mr. Kenneth Swan, and Mr. G. S. W. Marlow (instructed by Messrs. Seaton, Taylor and Co.) for the defendants (respondents).

It will be remembered that Mr. Justice Astbury held that having regard to the prior publications, the step taken by the patentees was not invention, and that, although hexyl resorcinol had in fact never been made until the patentees made it, the patent was invalid for want of subject matter.

This judgment was adopted in its entirety and without reservation by each member of the Court of Appeal, but in view of the new and important questions of law argued on the appeal, the judgment of the learned lords justices is of extreme cogency.

Master of the Rolls

The Master of the Rolls said that Mr. Justice Astbury had held that the patent was not only bad for want of subject matter but also for anticipation, since all that was left to the patentees was verification. He held, against the appellant's contention, that their patent dealt with the manufacture of therapeutic substances; it dealt with the manufacture of chemical substances, and the reference to therapeutic properties was a mere statement of qualities. He said that the evidence of the parenthood of the plaintiff's process was to be seen in the documents cited by the defendants, and the patentees had taken no inventive step, but had merely verified a prediction. The words used by Lord Davey in 1906, which appeared to give some ground for the appellants' contention that if a substance were new and were found to have valuable properties it would be good subject matter for a patent, (the novelty of the process being immaterial because the invention would lie in the substance), were a mere *obiter dictum* and they had been challenged, in particular, by Lord Justice Sargant and Lord Shaw. The latter in 1926 had said that if Lord Davey's words were read as implying that a new substance made by no new process was patentable, such a statement of the law would be unsound. He agreed with this view; moreover, after consideration of Section 38A of the Patents and Designs Acts 1907 and 1919, he was confirmed in the interpretation he gave when Solicitor-General in M's case of the word "special" in the phrase "The specification shall not include claims for the substance itself except when prepared . . . by the special processes . . . described and claimed . . ." These words, in their context, having in mind also the proviso (in which the words "patented process" occurred) shewed that the word "special" implied a process which had some intrinsic characteristics which were the invention of the inventor and for which a patent might properly be granted.

Lord Justice Sargant

Lord Justice Sargant said that the alleged invention was primarily for the substances, whether pure or not or whether of therapeutic value or not, and only secondarily for the processes, the processes only being claimed in view of Section 38A of the Act. The anticipatory documents in their ordinary meaning amounted, if true, and their truth was demonstrated, to complete disclosure; the fact that one of Johnson's papers had been published in the same year as Clemmensen's first paper, gave significant evidence of the rapidity with which this method (which had been adopted by the plaintiffs) was taken up, tested and accepted as generally applicable. The relative proportions of the ingredients in the patent and in Johnson's and Clemmensen's papers shewed how saturated the patentees were with the earlier investigations; the plaintiffs could not suggest that the defendants were building up a "mosaic" of anticipations, for they themselves had obviously studied these very papers. The sole difference between the parties

on the evidence was whether the predictions of the anticipatory documents could be accepted as conclusive. The plaintiff's experts desired to verify them, but the patentees, having described only two further steps (beyond the four already known), had adopted the defendants' experts' attitude by claiming with confidence the rest of the homologous series. The practical application of chemistry (which after all was a science and not a mere collection of isolated phenomena) would be unduly hampered by the upholding of such a patent. It merely verified, as regards each higher homologue of a series, the accuracy of a general statement as to the methods of production of the series in question and a chemist could not successfully claim a monopoly in the production of such higher homologues, either together with or apart from still higher homologues.

Hexyl Resorcinol was not a new substance of the kind predicated by Lord Davey in 1906, and further, the passage in question had been disapproved, if read in aid of such a set of facts as those in question. In the case of a patent for a substance, just as for any other patent, there must be at least a "scintilla" of invention in connection with the process and material; this accorded with Section 38A and the decision of Sir Ernest Pollock (Lord Hanworth) in M's case, although Section 38A was not of great importance in the present case, since in any event there was not sufficient invention to justify a patent for a new substance.

The evidence of the defendant's chemist, Dr. Marshall, was of great importance; knowing nothing of the patent, he had been able to produce hexyl resorcinol on a commercial scale, with reasonable rapidity and without great difficulty by following the directions of Clemmensen and Johnson. This indicated clearly that even if the patent had not actually been completely anticipated, there was no invention in what the plaintiffs claimed.

Lord Justice Lawrence

Lord Justice Lawrence also construed the patent as one for alkyl resorcinols, whether pure or not, or whether of therapeutic value or not. The patentees had adopted Clemmensen's and Johnson's methods and there was no suggestion that they had any difficulty in applying them, nor that the predictions were incorrect. The patentees claimed to be the "true and first inventors of a new manufacture," because they said that they had conceived the idea of making the substances, that they had in fact made them, and had then ascertained their properties. The patentees had not been invited to state in the box what was the genesis of their alleged invention, and the Court must infer from the anticipatory documents that these were the true inspiration for the patentees. From Dr. Marshall's evidence it was clear that they showed the alleged invention to him, and it did not matter whether the plaintiffs' experts would or would not accept the truth of the statements. None of the four specifically described substances in the patent was a "new" manner of manufacture within the Statute of Monopolies; but even though the prior publications were not, as he thought they were, a complete anticipation, the step from the publications taken by the patentees was not one calling for any inventive faculty.

The ascertainment of the valuable properties of a substance was doubtless important in building up utility, but it was not of itself, (especially when the substance was one which it was open to anybody to make) a patentable invention; it was mere discovery. The patentees had not even suggested they had any difficulty in applying the necessary tests to ascertain the properties and in this case it was also mere verification.

If the patentees, by merely ascertaining that well known reactions worked in accordance with a prediction, could have a good patent because some unknown factor might possibly falsify the prediction, the field for new patents would be enormously extended, as there might be as many patents for alkyl resorcinols as there were normal and isomeric fatty acids. The strongest case in favour of the plaintiffs was *Badische v. Levinstein*, but in that case Dr. Griess had himself gone into the box and stated that he had never thought his diazo reaction could have been applied to the naphthols; in the present case, the discoverers, in giving their results to the world, had expressly stated that in their opinion they were applicable to the bodies to which the patentees had applied them; the patentees sought to appropriate such discoveries.

The appeal was dismissed with costs.

Chemical Trade Returns for February

Further Improvement in Export Trade

THE Board of Trade Returns for February indicate that during the month of February imports of chemicals, drugs, dyes and colours amounted to £1,150,942, a decrease of £43,261 compared with the parallel period in 1927 and a decrease of £38,846 on February, 1926; exports were valued

at £1,993,789, an increase of £301,543 compared with February, 1927, and an increase of £39,514 on February, 1926; and exports of imported chemicals were valued at £74,131, an increase of £7,945 on February, 1927, and a decrease of £29,713 on the figures for February, 1926. Details are as follows:—

	Imports		Value		Quantities		Value	
	Month ended February 29, 1927.	Month ended February 29, 1928.	Month ended February 29, 1927.	Month ended February 29, 1928.	Month ended February 29, 1927.	Month ended February 29, 1928.	Month ended February 29, 1927.	Month ended February 29, 1928.
CHEMICAL MANUFACTURES AND PRODUCTS—								
Acid Acetic tons	943	1,307	39,721	56,994				
Acid Tartaric cwt.	2,762	3,217	13,243	18,143				
Bleaching Materials ..	13,783	10,916	5,992	8,603				
Borax	4,120	13,330	4,721	11,224				
Calcium Carbide ..	75,870	52,032	50,856	31,023				
Coal Tar Products, not elsewhere specified value	—	—	68,130	6,838				
Glycerine Crude ... cwt.	3,494	144	13,963	450				
Glycerine Distilled ..	174	398	772	1,382				
Read Lead and Orange Lead	5,997	3,741	10,394	6,144				
Nickel Oxide	137	—	639	—				
Potassium Nitrate (Salt-petre) cwt.	10,789	10,686	12,306	11,023				
All other Compounds ..	433,726	280,973	91,284	86,672				
Sodium Nitrate ..	103,640	104,941	66,354	50,894				
All other Compounds ..	41,663	38,313	27,981	22,922				
Tartar, Cream of ..	4,992	3,054	18,023	13,157				
Zinc Oxide tons	610	925	21,399	29,525				
All other Sorts ... value	—	—	273,484	258,324				
DRUGS, MEDICINES, ETC.—								
Quinine and Quinine Salts oz.	107,492	156,325	8,912	12,042				
Bark Cinchona, etc. cwt.	1,177	90	5,456	384				
Other Sorts value	—	—	103,824	135,159				
DYES AND DYESTUFFS, ETC.—								
Intermediate Coal Tar Products cwt.	3	46	50	458				
Alizarine	98	107	5,369	2,667				
Indigo, Synthetic ..	—	—	—	—				
Other Sorts	3,075	3,051	89,097	70,347				
Cutch	3,099	4,096	6,453	6,088				
All other Sorts	2,382	1,769	6,842	7,324				
Indigo, Natural	98	135	2,599	4,037				
Extracts for Tanning (solid or liquid) ..	102,885	143,950	109,439	164,708				
PAINTERS' COLOURS AND MATERIALS—								
Barytes, ground, and Blanc Fixe cwt.	48,931	72,413	12,696	16,159				
White Lead (dry) ..	11,894	10,785	21,074	15,794				
All other Sorts	68,645	72,618	103,130	102,457				
Total of Chemicals, Drugs, Dyes, and Colours value	—	—	1,194,203	1,150,942				
CHEMICAL MANUFACTURES AND PRODUCTS—								
Acid Sulphuric cwt.	2,040	1,936	1,928	2,267				
Acid Tartaric, including Tartrates, not elsewhere specified .. cwt.	1,413	2,203	7,559	13,886				
Ammonium Chloride (Muriate) tons.	327	318	8,081	7,621				
Ammonium Sulphate—								
To Spain and Canaries tons	4,330	1,150	49,106	11,739				
.. Utaly	542	578	6,305	5,702				
.. Dutch East Indies tons	—	5,111	—	53,256				
.. Japan	1,343	7,480	15,765	76,643				
.. British West India Islands and British Guiana tons	143	560	1,689	5,704				
.. Other Countries ..	4,695	11,311	53,743	116,663				
Total	11,053	26,199	126,608	269,707				
Bleaching Powder (Chloride of Lime) cwt.	31,862	40,442	14,865	15,439				
COAL TAR PRODUCTS—								
Anthracene cwt.	—	—	—	—				
Benzol and Toluol galls.	317	590	44	53				
Carbolic Acid cwt.	8,641	22,001	16,080	41,301				
Naphtha gall.	5,285	3,619	509	340				
Naphthalene cwt.	483	855	478	651				
Tar, Oil, Creosote Oil, etc. gall.	282,987	2,862,657	12,181	104,052				
Other Sorts cwt.	34,120	67,987	28,021	31,099				
Total value	—	—	57,325	177,502				
Copper, Sulphate of .. tons	6,083	5,546	136,390	126,969				
DISINFECTANTS, ETC. cwt.	26,504	42,330	71,879	98,427				
GLYCERINE, Crude ..	2,412	2,549	7,707	8,003				
Glycerine Distilled ..	11,241	15,549	58,856	62,743				
Total	13,653	18,098	66,563	70,746				
POTASSIUM COMPOUNDS—								
Chromate and Bi-chromate cwt.	2,967	2,559	5,319	4,525				
Nitrate (Salt-petre) ..	1,626	1,513	3,153	2,857				
All other Sorts	3,319	1,552	12,237	11,923				
Total	7,912	5,324	20,709	19,305				
SODIUM COMPOUNDS—								
Carbonate, including Soda Crystals, Soda Ash and Bi-carbonate cwt.	520,396	462,565	154,978	126,689				
Caustic	192,312	167,911	139,306	106,784				
Chromate and Bi-chromate cwt.	1,792	3,143	2,372	4,204				
Sulphate, including Salt Cake	34,939	13,074	4,819	1,993				
All other Sorts	33,558	52,306	34,153	62,684				
Total	782,997	698,999	335,628	302,354				
ZINC OXIDE tons	49	85	2,166	3,062				
CHEMICAL MANUFACTURES, ETC., all other sorts value	—	—	236,965	275,276				
Total of Chemical Manufactures and Products ..	—	—	1,080,666	1,382,561				
DRUGS, MEDICINES, ETC.—								
Quinine and Quinine Salts oz.	144,116	206,930	13,943	20,351				
All other Sorts value	—	—	237,938	213,363				
Total	—	—	251,881	233,714				
DYES AND DYESTUFFS—								
Products of Coal Tar cwt.	4,655	7,586	41,523	62,709				
Other Sorts	5,127	7,314	5,940	6,289				
Total	9,782	14,900	47,463	68,998				
PAINTERS' COLOURS AND MATERIALS—								
Barytes, ground, and Blanc Fixe cwt.	665	167	324	170				
White Lead (dry) ..	2,486	3,818	4,769	7,334				
Paints and Colours in paste form cwt.	51,579	48,064	114,619	95,314				
Paints and Enamels Prepared cwt.	27,656	35,034	92,744	114,205				
All other Sorts	43,291	47,808	93,780	91,484				
Total	125,677	134,891	306,236	308,510				
Total of Chemicals, Drugs, Dyes and Colours ... value	—	—	1,692,246	1,993,789				

Re-exports

	Quantities.		Value.	
	Month ended February 29, 1927.	Month ended February 29, 1928.	Month ended February 29, 1927. £	Month ended February 29, 1928. £
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Tartaric.....cwt.	77	65	476	515
Borax....."	160	77	163	71
Coal Tar Products, value	—	—	12	3,640
Potassium Nitrate (Salt- petre).....cwt.	87	98	121	165
Sodium Nitrate....."	1,082	4,576	692	2,445
Tartar, Cream of....."	612	583	2,329	2,828
All other Sorts.....value	—	—	13,931	18,273
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts.....oz.	10,945	15,657	1,134	1,632
Bark Cinchona, etc. cwt.	89	92	384	318
All other Sorts.....value	—	—	33,539	31,992
DYES AND DYE STUFFS—				
Cutch.....cwt.	1,633	1,973	2,467	3,193
All other Sorts....."	180	175	1,940	1,084
Indigo, Natural....."	3	13	85	394
Extracts for Tanning (solid or liquid).....cwt.	2,221	750	3,050	1,047
PAINTERS, COLOURS AND MATERIALS.....cwt.				
	1,108	2,517	4,749	5,438
Total of Chemicals, Drugs, Dyes and Colours.....value	—	—	66,186	74,131

New Power Plant for Billingham

Contract Secured by a British Firm

IMPERIAL Chemical Industries, Ltd., have placed an exceptionally large contract for steam turbines, with generators and condensing plant, with the Metropolitan Vickers Electrical Co., Ltd., the contract having been awarded after severe international competition. The contract is for nine turbo alternator sets, with an aggregate output capacity of 93,000 kilowatts (equal to 125,000 brake horse power), to form the equipment of a new power station for the new chemical works now under construction for Synthetic Ammonia and Nitrates, Ltd., at Billingham-on-Tees. The power station will have a capacity appreciably greater than that of the well-known Manchester Barton generating station, the equipment of which consists so far of three Metrovick 25,000 kW. sets, and the contract is one of the largest for power plant ever placed in Great Britain.

The large scale on which the operations of Imperial Chemical Industries, Ltd., are conducted naturally creates a special outlook on power production problems, and it is of interest to note that besides providing electric power supply in the new equipment, more than half the total steam to be generated will be used for manufacturing process work, having first of all passed through the high-pressure turbines. Whilst the double use of steam, first to obtain electric power from turbo generators and afterwards at a suitably reduced pressure for process work, is not new, the new installation will be of particular interest in that this system will be applied on an unusually large scale, and that the many problems involved in order to obtain from the coal consumed the greatest possible combined output in electrical power and in heat for process work have been worked out with great thoroughness.

Details of the Plant

The plant now ordered from the Metropolitan Vickers Electrical Co. comprises a total of nine turbo-alternator sets, three-phase, 40 cycles, 2,400 r.p.m., 6,300 volts, arranged as follows:—three 12,500 kW. M.C.R. primary sets, three 12,500 kW. M.C.R. condensing sets, and three 6,000 kW. M.C.R. feed-heating sets. Two sets in each group will be working when the station is on full load, the other set in each group being used as a stand-by.

The primary turbines will be designed for operation by steam at a stop-valve pressure of 630 lb. per sq. in. gauge, superheated to a total temperature of 833° F., each set exhausting approximately 5,850 tonnes (one tonne equals 2,200 lb.) of steam per day at a pressure of 275 lb. per sq. in. and a temperature of 662° F.; the electrical output under

these conditions will be about 12,000 kW. for each set, this being the service rating.

The exhaust steam from the primary sets will be led to a set of steam receivers, whence it will be distributed, the greater portion being taken to various parts of the chemical plant for process work, etc., some to the last stage feed heaters, and the remainder supplying the condensing and feed-heating turbo-alternator sets. As a stand-by, and to provide for any sudden increase in the quantity of steam required, a set of reducing valves with de-superheaters will be installed under a separate contract as by-passes to the primary turbines.

The feed heating turbo sets will comprise:—Three feed heating turbines, three sets of five-stage vertical feed heaters, four sets of boiler feed pumps, and three sets of heater drain pumps. The feed heating turbines are designed for operating with superheated steam at a pressure of 260 lb. per sq. in. gauge, and exhausting at a pressure a little below atmospheric.

The exhaust steam from these turbines will be led partly to the first stage feed-heaters, and the remainder to the evaporating equipment which is being supplied under another contract. Three tapping points will be provided at the turbines from which steam is led to the second, third, and fourth stage feed-heaters, the fifth stage being, as already mentioned, fed direct from the receivers into which the primary turbines exhaust. The feed water heaters will be of the surface type, vertical pattern, fitted with float-controlled automatic by-passes.

Three sets of boiler feed pumps will be supplied, each equipment consisting of a low pressure and an intermediate pressure pump coupled together and driven by a motor, and a separate motor driven high pressure pump, a fourth boiler feed pump with a single feed water heater forming a stand-by. There will be three sets of heater drain pumps, comprising the necessary motor-driven extraction and lift pumps for removing the condensed heating steam from the heaters, each pump discharging into the boiler feed main after the heater which it serves. The whole of the pumps will be supplied by Mather and Platt, Ltd., as sub-contractors.

Steam for Chemical Processes

The considerable use of steam directly applied to chemical processes makes it necessary that the capacity of the evaporating equipment providing the necessary boiler feed make-up should be much greater than is usual with ordinary turbo plant. The whole of the make-up, together with the condensed steam returned from the various portions of the works plant, will be treated in de-aerators (not included in this contract) and thence pumped through the feed water heaters in which the temperature will be raised to about 400° F.

The condensing turbines will utilise the remainder of the steam exhausted by the primary turbines and are intended to act as equalisers for the system. The conditions of service do not permit of fluctuations of load being carried by either the primary or the feed heating turbines. All fluctuations in requirements of steam or electrical output, or of both together, will therefore be carried by the condensing turbo-alternator sets. Under the normal operating conditions of the plant the service rating of the condensing sets will be about 8,000 kW. but each set will be capable of carrying 12,500 kW. continuously, the alternators being duplicates of those for the primary turbo sets.

The alternators will be of standard Metrovick design. The six larger units will have a capacity of 15,625 kVA., and the three smaller units a capacity of 7,500 kVA. All the machines will be arranged for ventilation on the Metrovick patent closed-circuit air-cooling system.

The whole of the plant has been designed on lines laid down by Mr. H. A. Humphrey, the consulting engineer to Imperial Chemical Industries, Ltd. It will be erected under the supervision of Mr. T. M. Wilson, chief engineer of Synthetic Ammonia and Nitrates, Ltd., and of Mr. D. M. Buist, the electrical engineer of that company.

The C.A. Year Book

SUBSCRIBERS are reminded that an addenda slip of additional entries to the Directory Section of THE CHEMICAL AGE YEAR BOOK, 1928, is included in this issue, for the purpose of being attached to the Year Book list of trade addresses.

Chemical Society's President-Elect

THE president-elect of the Chemical Society, Professor Jocelyn Field Thorpe, who will be elected at the annual general meeting of the Society on March 22, has been professor of organic chemistry at the Imperial College of Science and Technology since 1914. He was born in 1872, and educated at Worthing College, King's College, London, the Royal College of Science, and the University of Heidelberg, having obtained the Ph.D. degree of the latter university in 1895. In the same year he joined the staff of Owens College, Manchester (later the University of Manchester), where he remained till 1910, occupying various posts. From 1909 to 1913 he was Sorby Research Fellow of the Royal Society. Among his distinctions are C.B.E., Chevalier de la Légion d'Honneur, D.Sc. (Manchester) and F.I.C. He was elected a Fellow of the Royal Society in 1908. In 1921 he received the Longstaff Medal of the Chemical Society, and in 1923 the Davy Medal of the Royal Society. He is a member of the Chemistry Co-ordinating Research Board and of the Forest Products Research Board of the Department of Scientific and Industrial Research, of the Chemical Warfare Committee of the War Office, and of the Safety in Mines Research Board; and chairman of the Explosions in Mines Committee of the Department of Mines and of the Dyestuffs Development Committee of the Board of Trade. At present he is also acting as a member of the Board of Trade Committee which is inquiring into the complaint made against the exclusion of calcium biphosphate of baking powder quality from the list of articles dutiable under the Safeguarding of Industries Act. He was a member of the Advisory Council of the Department of Scientific and Industrial Research from 1916 to 1922, president of the Indian Chemical Services Committee in 1920, and has held various offices in the Chemical Society and the Royal Society. His researches in organic chemistry, published in numerous memoirs in the *Journal of the Chemical Society*, give him high rank among the organic chemists of our time, and at the Imperial College his inspiration has given rise to a large volume of research work by his students.

Oil Purification Case

Appeal Dismissed in House of Lords

ON Friday, March 9, Viscount Sumner and Lords Warrington and Atkin, in the House of Lords, dismissed the appeal of the Medway Oil and Storage Co., Ltd., which arose out of their action against the Silica Gel Corporation, of Maryland, U.S.A., for the return of the purchase price of a silica gel unit for purifying petroleum oils and for damages. The plant, which was to cost £10,750, was erected at the oil company's works at the Isle of Grain, Kent, but after running for about five weeks it was shut down, the company alleging that the petrol, after passing through the silica gel plant, contained so large a percentage of gum as to render it unmerchantable for motor petrol.

After nineteen days' hearing Mr. Justice Rowlatt found that neither the oil company nor the plant manufacturers had perceived the position as to the danger of gum, but he held that there had been a breach of an implied warranty under the Sale of Goods Act. He gave judgment for the Oil Co. for £17,488. This decision was reversed by the Court of Appeal, who gave judgment for the plant manufacturers for £3,242, the balance of the purchase price. The Oil Co. then took the case to the House of Lords.

Viscount Sumner, in moving that the appeal should be dismissed, said the section of the Act did not say that the reliance on the seller's skill or judgment was to be exclusive of all reliance on anything else—on the advice, for example, of the buyer's own experts, or the use of his own knowledge or common sense, nor would it ever be possible to be sure that the element of reliance on the seller entered into the matter at all. There was great difference between relying on the truth of the sellers' representations as to matters of fact and relying on the skill or judgment of the seller to supply a suitable article. The buyers knew that the process had only been tried so far on a small scale, and if a buyer openly took his own precaution no seller would understand in these circumstances that such a customer was really showing a child-like reliance on his skill or judgment. Lords Warrington and Atkin concurred, and the appeal was dismissed.

Engineer's Claim Against German Partner

A Pre-War By-product Plant Business

IN the second Division of the Anglo-German Mixed Arbitral Tribunal—the court comprising Baron Van Heeckeren, president, Dr. Heber Hart, K.C., British member, and Dr. Johannes, German member—there was heard a claim by Mr. Donald Bagley, of the firm of Bagley, Mills and Co., Ltd., of 92, Victoria Street, Westminster, against a German national named Mr. Carl Still for the sum of £18,115, plus interest at 5 per cent. from August, 1914, in respect of orders for coke oven, benzol and other plant.

Mr. A. Cohn was counsel for the claimants, and Dr. Wilke represented the respondent and the German Government.

Mr. Cohn said that the creditor was an engineer and contractor who specialised in the designing and construction of by-products and allied chemical plant, and in his particular line there were probably less than a dozen carrying on business in the whole world. Mr. Donald Bagley, at about the end of 1909, got into touch with Mr. Still who, although not a man of great financial resource personally, had very great financial backing in Germany, and apart from that was a man of very great skill and very reliable and trustworthy in his technical knowledge and experience. As a result they became associated. In 1911 they made an agreement, which applied to Great Britain and the Colonies, by which Mr. Still appointed Mr. Bagley as sole representative.

The business in England proceeded very satisfactorily. Mr. Bagley got one contract for £150,000 and others as well. Mr. Bagley then conceived the idea of extending their operations to the United States, and he went there, after he had met in Europe one of the principal members of the United States Steel Corporation, which controlled all the most important concerns which would have use for those particular plants. In 1911 he opened an office in the United States, and on returning proposed to Mr. Still that they should make the same agreement which they had already made for England and the Colonies apply to the United States. A second agreement was therefore made in those terms. Mr. Still himself went with Mr. Bagley to America, and was there introduced to the leaders of the United States Steel Corporation and of other companies.

The Standard Oil Co. allowed him to see their works, and with their assistance he found a certain petrol to take the place of benzol as used by Mr. Still in the plants made in Europe. In August, 1913, there was a meeting of a committee appointed by the United States Steel Corporation to settle the whole question of benzol recovery, and it was finally decided to accept their type of plant, and Mr. Bagley was formally told so. He was informed also that they had decided to instal Mr. Still's plant at the Carnegie works. The claimant's case was that he was entitled to commission, etc., up to within a year of the dissolution of the contracts brought about by the war.

Dr. Wilke argued that the contracts had gone by reason of the war, and that under German law commission was not payable until payments in respect of them had been made.

Mr. Honour, the British Government agent, agreed with Dr. Wilke that the contracts had gone, but there remained a question as to the pecuniary obligation arising out of what was done before the dissolution.

The case was adjourned after a prolonged hearing.

German Claim Against Mersey Chemical Works

IN the Second Division of the Anglo-German Mixed Arbitral Tribunal on Monday the case was mentioned, by Dr. Loehning, representing the German Government, of a claim by Farbwerke vorm Fr. Bayer and Co. against the Mersey Chemical Works, Ltd. (in liquidation); Mr. McGowan being present for the British Clearing Office.

Dr. Loehning said that in that case they asked for a consent judgment to this effect: That upon the German Clearing Office re-crediting to the British Clearing Office under Article 297 "H" of the Treaty of Versailles, the sum of £1,179 14s. 2d. previously credited by the British Clearing Office under that Article, by consent the same sum is to be credited to the German Clearing Office under Article 296, together with interest at 5 per cent. from June 19, 1919.

There were to be no costs on either side.

Standardisation and Simplification

British Central Committee Formed

THE President of the Board of Trade (Sir Philip Cunliffe-Lister) presided at a meeting on Thursday, March 8, to consider means for the further development of standardisation and simplification. Those present included Sir Richard Glazebrook, Mr. Maurice Wilson and Mr. le Maistre, of the British Engineering Standards Association; Sir William Larke, National Federation of Iron and Steel Manufacturers; and Mr. D. A. Bremner, British Engineers' Association.

The President recalled the resolution passed at the Imperial Conference in 1926 in favour of the further development of standardisation. It was felt that before this country was in a position to participate effectively in an inter-Imperial movement, some further progress must be made here, and the President had called the present influential meeting to ascertain the views of some of the representative associations in British industry on the question of initiating a forward movement. With regard to standardisation proper it was most desirable that the valuable work conducted by the British Engineering Standards Association should be continued and developed by that body. Attention had, however, been drawn—largely by the work done in the United States and Germany—to the great economies which might be effected in many trades by what was known as simplification or the elimination of unnecessary types of articles to the consequent advantage of producers, distributors and users. This was work which must in detail be performed by those actually concerned in particular industries, whether as manufacturers, dealers or users. At the same time the experience of other countries confirmed the view that some central organisation was necessary. He suggested that the meeting should consider whether it would be desirable to establish a central committee which would undertake this work.

The subsequent discussion showed a general agreement as to the importance of developing standardisation and simplification further than the movement had yet gone in this country, and as to the necessity of having some central organisation of the kind suggested. The meeting requested that a representative of the Board of Trade should act as chairman of the proposed body. It was accordingly decided to set up a committee under the chairmanship of Mr. Herbert Williams, M.P., consisting in the first instance of the representatives of the associations enumerated above, together with representatives of the Government Departments concerned. The first meeting of the new body was fixed for March 27.

A Prodorite Exhibit

THE stand of Prodorite, Ltd. at the Birmingham British Industries Fair, illustrated the great developments that have been effected in the production of this acid-proof concrete since their last exhibit in London, and a very representative exhibit showed the lines now being manufactured.

To demonstrate the requisite properties of a floor where the qualities of resistance to heavy wear and tear, added to the presence of acids, are required, the entire floor of the stand, about 20 sq. yds. in area, had been put down in Prodorite pre-cast slabs which were laid and welded on the site, thus showing a complete acid-proof concrete floor.

Monolithic tanks of Prodorite are made in a variety of sizes up to 550 gallons capacity, and a small size, 4 ft. by 3 ft. by 2 ft. 6 in. deep, was on view. Since these are suitable only for cold or warm liquids, it was realised some time ago by the firm that a method of employing the valuable acid-proof properties of Prodorite for large tanks for hot liquids would have to be developed, and this has been successfully accomplished by means of a system of lining with pre-cast bricks of special design, which are used in conjunction with vats and reservoirs of various construction. This system was shown by full-sized sections of containers built both of brickwork and of reinforced Portland cement concrete. They were complete in every detail, and the section employing a blue brick wall for the outer retaining structure was especially recommended for very heavy duty pickling vats, where mechanical wear and tear is very strenuous, quite apart from the presence of hot mixed acids. The construction of pitch pine guarding timbers was also shown in every detail. This construction is being successfully employed in pickling vats for long tubes, and vats have been made up to 60 ft. long to hold the hot mixtures

of hydrochloric and nitric acids. The concrete construction is similarly lined with Prodorite bricks and is sometimes more suitable than the brick outer.

The stand also had some very interesting technical exhibits demonstrating the acid and temperature resisting properties of the material. Of particular interest was a large glass vessel containing some Prodorite lining bricks completely immersed in stainless steel pickle, which is a mixture of hydrochloric and nitric acids.

Chemical Matters in Parliament

Beet Sugar Subsidy

THE Financial Secretary to the Treasury, in a "statement of excess" issued on March 9, explains that a sum of £25,858 has to be voted to make good an excess on the grant for beet sugar subsidy, Great Britain, for the year ended March 31, 1927. The excess arose from the fact that, in the case of a certain group of companies, a process of de-sugarisation of molasses, formerly carried out in the summer, was advanced several months.

Dead Sea Salts

Mr. Amery, replying to Colonel Howard-Bury (House of Commons, March 12), said he was quite unable to give any figure as to the estimated value of the potash salts and bromides in the Dead Sea. It had been estimated that the waters of that sea contained some 2,000,000,000 metric tons of potassium chloride, and 980,000,000 metric tons of magnesium bromide. Their possible value depended on various factors. In reply to a further question he stated that he did not know whether there was enough potash there to export 1,000,000 tons a year for the next 2,000 years. In the Dead Sea, as in the ocean itself, there were unlimited quantities of valuable materials which it might not be easy to extract at a profit.

Nottingham Section of the S.C.I.: Annual Meeting

DR. E. B. R. PRIDEAUX (chairman), presided at the annual meeting of the Nottingham section of the Society of Chemical Industry, held at University College, on Wednesday, March 7. The following officers were elected:—Dr. F. L. Pyman (chairman); Dr. J. B. Firth, Mr. G. J. Ward, and Dr. E. B. R. Prideaux (vice-chairmen); Mr. D. J. Law (hon. treasurer); Mr. W. T. T. Ainsworth (hon. secretary). The annual meeting was followed by an ordinary meeting, at which Mr. F. S. Sinnatt read a paper on "The Formation and Structure of Cenospheres," in which he pointed out that our knowledge of the specific properties of coke which made it suitable for a particular process was by no means extensive. The problems involved were so complex that it had been necessary for investigators to concentrate upon the type of coke produced in some branch of the carbonisation industry. After discussing the heterogeneous nature of coal seams, Mr. Sinnatt said that it was possible to obtain weak uneven coke from a seam which, when the layers were intimately mixed would yield strong uniform coke. This had led to the study of the carbonisation of small discrete particles as distinct from the coking of a mass of coal. Dealing with recent work he stated that when carefully sized coal particles were allowed to fall down a tube at a predetermined temperature in an atmosphere of nitrogen, carbonisation took place, and when allowed to enter the tube heated to 550–600° C. the majority were converted to hollow spheres possessing irregular surfaces broken by minute resicles, from which characteristics they were termed "cenospheres." In these, two main structures could be detected.

Appointments Vacant

A Junior Assistant in the Directorate of Explosives Research, Research Department, Woolwich.—The Chief Superintendent, Research Department, Woolwich, London, S.E.18.

A Principal and Head of the Metallurgical Department of the County Technical College, Wallasey.—The Director of Education, County Education Offices, Stafford. March 24.

A Lecturer in Chemistry at the Chelsea Polytechnic.—The Secretary, Chelsea Polytechnic, Manresa Road, S.W.3. March 24.

A Teacher of Rubber Technology at the Northern Polytechnic, Holloway, N.7.—The Clerk to the Governors. Full details are given in our advertisement columns, p. xvii.

From Week to Week

AN ISSUE OF 1,400,000 £1 ordinary and 700,000 1s. deferred shares will shortly be made by the British Acetate Silk Corporation, Ltd.

MR. STANLEY A. SADLER, chairman of Sadler and Co., chemical manufacturers, has been elected as alderman of the Middlesbrough Town Council.

SIR WILLIAM J. POPE, F.R.S., is to act as consultant on chemical matters to the Yorkshire Artificial Silk Co., which has bought a factory at Brighouse.

A DONATION OF 250,000 kroner has been made by the Rockefeller Institute for the erection of a new bio-chemical research institute in Stockholm. Swedish donors will give a similar amount. The new institute will be opened next year.

THE ANNUAL COLLOID SYMPOSIUM will this year be held at Toronto, on June 14-16. Many leading colloid chemists from the United States and Canada will be present, and it is expected that some distinguished chemists will go from Europe.

THE COMMITTEE OF THE MILAN FAIR is organising a show of Italian and foreign industrial films to take place during the Fair (April 12-June 19). Regulations and application forms may be seen at the Department of Overseas Trade, 35, Old Queen Street, S.W.1.

MR. EDWARD HINKS, M.B.E., B.Sc., F.I.C., has been elected president of the Society of Public Analysts and Other Analytical Chemists. He has already filled the post of honorary treasurer of the Society. Mr. Hinks is public analyst and official agricultural analyst for Surrey.

IT IS REPORTED that zinc-producing companies of Upper Silesia, headed by the Giessche Co. and the Hohenlohe, Henckel and Donnersmarck companies, have formed a sulphuric acid syndicate which will become active at the end of December with an estimated increased production amounting to about 200,000 metric tons.

THE EMPLOYERS ASSOCIATED WITH Sir Alfred Mond in the effort to improve industrial relations have confirmed the date suggested by the General Council of the T.U.C. for a meeting between the sub-committees of the two sides. This conference will be held at Burlington House, London, on March 21, when Sir Alfred will have returned from his Eastern tour.

THE CREDITORS OF SUZUKI AND CO., LTD., met under a winding up order at the Board of Trade offices, Carey Street, on Wednesday. As regards the London branch, liabilities amount to £100,668 and assets have realised £2,872. It is hoped that £15,000 will be remitted from the head office for creditors in England. The immediate cause of the failure of the company was the restriction of facilities by the Bank of Taiwan.

THREE MEN LOST THEIR LIVES in an explosion and fire at the factory of the Distillers' Co., Ltd., at King's Lynn, on Monday, and the main building, which was used for the production of acetone and butyl alcohol, was completely wrecked. The factory was bought from the Government by the company and came into use last summer. Damage is estimated at £50,000. An inquest was opened on Tuesday and was adjourned until Monday, March 19, for the attendance of the Inspector of Explosives.

THE REPORT OF A preliminary inquiry under the Boiler Explosion Acts, into an explosion from a kiler which occurred on September 27, 1927, at the Bentsliff Works, Eccles, the property of the Eccles Bleaching Co., Ltd., a branch of the Bleachers' Association, has just been issued. As a result of the explosion, four men were scalded, of whom two died in hospital. In the opinion of the inspector who carried out the inquiry, the explosion was due to the cover of the kiler having been replaced with its lugs in such a position relative to those on the neck piece, that a pressure of steam, unintentionally generated in the kiler, ultimately became sufficient to cause the lugs to slip apart. The Engineer Surveyor in Chief comments that it is very difficult to ensure that those who are handling steam appliances of this kind will take precautions against accidents, for which ample means are provided, as the danger of the careless methods followed is not appreciated.

UNIVERSITY NEWS.—*Sheffield*: Mr. E. J. Gooding has been appointed to a Research Fellowship in Glass Technology.—*Durham*: Mr. James Muir Smith has been recommended for the degree of Ph.D. for a thesis, "I.—Studies in the Nitration of Tertiary Aromatic Amines; II.—Reduction of Dimethoxysuccinic Anhydride; III.—Experiments upon Phthalic Dialdehyde."—*Nottingham*: Sir Jesse Boot has intimated that he will defray the whole cost of the building of the Great Hall at the new University and that Lady Boot will defray the cost of building the women's hostel. This benefaction is equivalent to a gift of about £75,000.—*Oxford*: In Congregation, March 13, Dr. Wilson Baker was appointed University demonstrator in chemistry and Mr. Cyril Carter was appointed University demonstrator in bio-chemistry.—*Liverpool*: In connection with the celebration of the twenty-fifth anniversary of the granting of the charter to the University the honorary degree of D.Sc. will be conferred upon Professor Robert Robinson, professor of organic chemistry in Manchester University.

THE POWELL DUFFRYN Co. is erecting 36 by-product coke ovens at Bargoed in the Rhymney Valley, which will have a carbonising capacity of about 400 tons a day.

PROFESSOR S. J. TRUSCOTT, professor of mining at the Royal School of Mines, has been elected president of the Institution of Mining and Metallurgy for the coming year.

AN EXPLOSION following an outbreak of fire occurred at the works of A. Boake Roberts and Co., Ltd., chemical manufacturers, Stratford, on Saturday, in an acid storage building, and two men were injured.

THE SOCIETY OF GLASS TECHNOLOGY will pay a visit to Germany from May 11 to May 26. A comprehensive tour has been planned and a meeting with the German Society of Glass Technology will be held at Aachen.

DR. H. LEVINSTEIN has been elected to the board of the Newtex Safety Glass Co., Ltd., which was formed to acquire the inventions for the manufacture of splinterless glass owned by the Non-Inflammable Film Co., Ltd., and John M. Newton and Sons, Ltd.

PROFESSOR H. B. BAKER, the retiring president of the Chemical Society, will take as the subject of his presidential address, to be delivered at the annual general meeting of the Society on Thursday, March 22, "The Constitution of Liquids: Some New Experiments."

MR. H. C. PARMELEE, editor of *Chemical and Metallurgical Engineering* and secretary of the American Institute of Chemical Engineers, is expected to arrive in Liverpool on April 14 on a business tour to this country, during which he hopes to spend some time in London.

A COMPLIMENTARY DINNER will be given on Wednesday, March 21, at University College, London, to the members of the Chemical Engineering Committee, the first Ramsay Professor (Mr. E. C. Williams), and the Ramsay Professor-elect (Dr. W. E. Gibbs) of Chemical Engineering.

DORMAN LONG AND CO., LTD., and Baldwins, Ltd., Great Britain, and Howard Smith, Ltd., steamship owners, are joining with the Hoskins Iron and Steel Co., Australia, for the purpose of developing the iron and steel industry at Port Kembla. The new company, which will be known as the Australian Iron and Steel Co., Ltd., will have a capital of £5,000,000.

MR. THOMAS BARCLAY (chairman and managing director), presiding at the annual meeting of Southall Brothers and Barclay, Ltd., held on Monday at Birmingham, said that the important additions to the Sattley Mills commenced in September last had been delayed by rain, but would shortly be completed, when a portion of the new plant would be at once installed. Another extension was contemplated, and it was not unlikely that they would still be building when they met again.

THE OCCURRENCE OF β -METHYLANTHRACENE in low temperature tar, which was established by Professor Morgan and Dr. D. D. Pratt, of the Chemical Research Laboratory, Teddington, is the subject of a note in *Nature* by Professor E. Börnstein, of Charlottenburg, who states that this confirms an earlier observation of his own. Professor Morgan and Dr. Pratt state that investigations on the aromatic hydrocarbons of low temperature tar are still in progress at Teddington. Other anthracene derivatives have been isolated in considerable quantities, together with complex hydrocarbons including the so-called "crackene," and further details of these researches will be published later.

DR. E. W. J. MARDLES, of the Royal Aircraft Establishment, Farnborough, read a paper on "Methods of Testing the Suitability of Paints, Varnishes, and Lacquers for Aeronautical Purposes" before the Oil and Colour Chemists' Association, at the Institute of Chemistry, London, on Thursday, March 8. The experimental results discussed in the paper related to protective coatings for metal and wood parts, and not to the tightening action on fabric by cellulose ester varnishes. Mention was made, however, of results obtained on metal and wood with these "dopes," some of which could be employed as lacquers and possessed special properties, e.g., a high resistance to aviation petrol and warm oil.

LT.-COL. S. J. M. AULD read a paper on "Development Problems in the Exploitation of Natural Gas" before the Institution of Petroleum Technologists, in London, on Tuesday. He dealt with the utilisation of the gas produced at an oilfield, which is of growing importance in Texas, Mexico, and Persia. The gases may contain as much as 12 per cent. by volume of hydrogen sulphide. In spite of this, it is to be anticipated that if the unpurified gas be used as fuel, no serious trouble would be experienced in modern boilers equipped with suitable and efficient methods of firing. This view has been borne out in practice, and Lt.-Col. Auld gave evidence in support of this. Among other topics with which he dealt was the question of stripping the gas of its valuable constituents.

Obituary

MR. WILLIAM PHILLIP, of Swansea, aged 81, well known in Wales as a metallurgist.

EMIL MAYRISCH, president of the European raw steel cartel, aged 67, as the result of a motor accident at Châlons-sur-Marne, France.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

- 285,156. VANILLIN AND I-VANILLIN, PROCESS FOR THE PREPARATION OF. F. Boedecker, 98, Schweinfurthstrasse, Berlin-Dahlem, Germany. Application date, November 12, 1926.

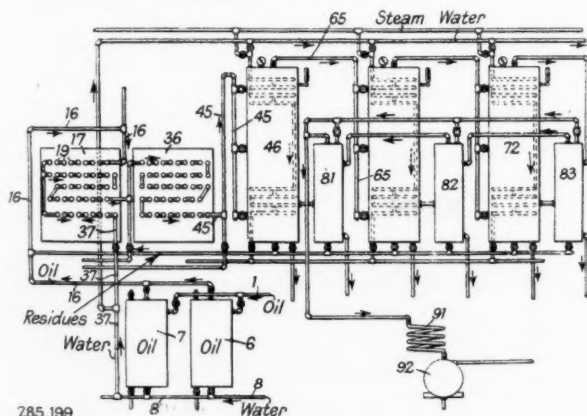
Safrol or isosafrol is treated under high temperature with an alcoholic alkali or an alcoholic solution of an alkali alcoholate, e.g., to 140°-170° C., and the methylene ether group is split up, the allyl radicle is molecularly changed and the alcohol is added on. It has been found that the product contains a mixture which contains the alkoxy methyl radicle in the meta and also in the para position to the propenyl group. The product is treated with methylating agents such as dimethyl sulphate and the resulting ethereal mixture is heated in alcoholic solution with dilute acids to obtain a mixture of isoeugenol and isochavibetol. This can be oxidised to the aldehydes and the vanillin and isovanillin then separated. Several examples are given.

- 285,159. EMULSIFICATION APPARATUS. G. C. Hurrell, 8, Kidbrook Park Road, Blackheath, London, S.E.3. Application date, November 13, 1926.

Emulsions such as those of oil and water may be made, or crude emulsions may be homogenised, by passing the mixture between closely adjacent smooth surfaces moving at high velocity and at high pressure. Emulsions can also be made by forcing the mixture between a conical valve and its seating under high pressure. Neither of the apparatus can be made in small sizes, and the object of this invention is to obtain an emulsifying apparatus of small size. A small single-acting pump is provided with an inlet valve only, but no outlet valve. The plunger is of considerable length with respect to the bore of the pump, and is provided with shallow circumferential grooves. The plunger has a diameter of about 0.0005 inches less than the barrel, so that on the pressure stroke the mixture is forced between the plunger and the walls of the barrel. The pressure may be more than 1,000 lb. per sq. in., and the mixture which escapes around the plunger is emulsified.

- 285,199. LIGHTER HYDROCARBONS, PROCESS FOR PRODUCING. E. S. Andrews, London. From Bernard Ormont Associates, Inc., 1, Madison Avenue, New York. Application date, December 11, 1926.

Oil is supplied through a pipe 1 to the upper ends of tanks 6, 7 and water through a pipe 8 to the lower ends of the tanks. The oil passes through pipe 16 to pipe coils 19 in a furnace 17

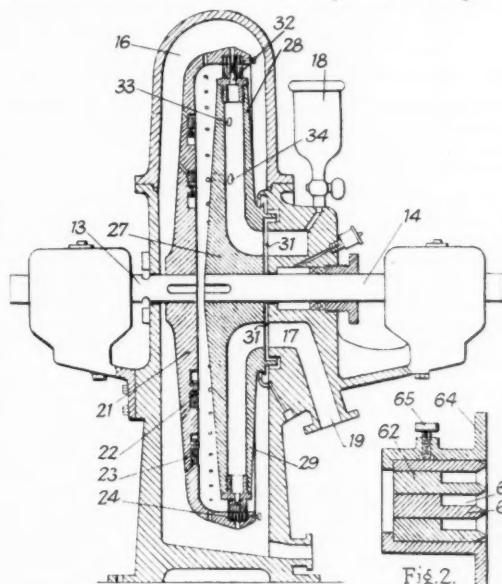


from which it passes to a similar furnace 36. The outlet pipe 45 from the latter furnace is connected to a condenser 46 at a number of points, each of which is provided with a valve. The central portion of the condenser is provided with horizontal perforated baffle plates, and the upper and lower ends

contain heating or cooling coils. Any vapour not condensed passes through pipe 65 to another condenser 70 of similar construction, and thence to another condenser 72. Collecting tanks 81, 82, 83 are connected to the lower ends of the three condensers. Vapour from the last condenser may pass into the tank 83 and thence into the tanks 82, 81. The latter is connected to a condensing coil 93, and compressor 92, which liquefies any remaining vapour. In addition to the oil which is supplied to the upper end of the pipe coil in the furnace 17, water is supplied through the pipe 37 to the lower end of the pipe coil and the oil vapour and water vapour meet and the mixture passes through the intermediate coils and thence to the furnace 36. The fractional condensates in the condensers 46, 70, 72 are of decreasing density and boiling point. It is found that the temperature in the furnaces 17, 36 may be kept below 750° F., so that the deposition of carbon in the heating pipes is minimised. The pressure in the system is approximately atmospheric. The pipe coils in the furnaces 17, 36 are preferably of an alloy of iron and silicon which appears to act catalytically, or an alloy of calcium, silicon, and iron or steel.

- 285,258. COLLOIDAL DISPERSION OF MATERIAL IN FLUIDS. J. Bourdais, 89, Rue des Martyrs, Paris. Application date, March 1, 1927.

The dispersion surfaces consist of flats plates 61 having shoulders 62 to space them apart, leaving spaces 63 through which is forced the material to be dispersed. The plates are



secured in a frame 64 by screws 65. The distance between the plates is a fraction of a millimetre and the mixture is forced between them at a velocity above 50 metres per second. The material to be dispersed should preferably form not more than 10 per cent. of the mixture. The dispersion is effected in a centrifugal machine comprising a rotor 27 mounted on a shaft 14. Colloidal material for use on starting the machine is fed from a vessel 18 to an annular chamber 17 communicating with ducts 31 in the rotor. The normal supply of colloidal material is through the passage 19. A second rotor 21 is mounted on a shaft 13, and is flanged to enclose the rotor 27. The rotor 27 has two projecting arms 28, 29 which are diametrically opposed, while the rotor 21 is circular and about double the diameter of the body of the rotor 27. The rotor 21 is formed with a series of annular grooves 22, 23, 24 for the

insertion of the dispersing devices previously described, and the mixture is directed against these from nozzles 32, 33, 34 so that it passes into the outer chamber 16. The rotors 21, 27 may rotate in opposite directions, or in the same direction, or one may be stationary.

285,260. ZINC CARBONATE, METHOD OF PRECIPITATING. N. A. Laury, Rockville Center, U.S.A. Application date, March 7, 1927.

Roasted zinc ore is heated to about 180° F. with a 20 per cent. solution of ammonium sulphate until the solution contains 4 per cent. of zinc oxide. The mixture is allowed to settle, and the solution removed, cooled below 40° F. and saturated with carbon dioxide at a pressure of about 20 lb. per sq. in. in a closed vessel. The precipitated zinc carbonate is separated and the solution used again for bleaching ore. The carbonate is of high purity, and may be converted into zinc oxide.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—263,200 (I. G. Farbenindustrie Akt.-Ges.), relating to vat dyestuffs of the benzanthrone series, see Vol. XVI, p. 238; 256,965 and 257,910 (I. G. Farbenindustrie Akt.-Ges.), relating to liquid hydro-carbons obtained from destructive hydrogenation of coal, see Vol. XV, pp. 403 and 501; 261,385 (H. T. Böhme Akt.-Ges.), relating to sulphonation of fatty acids and their esters, see Vol. XVI, p. 91; 269,477 (Soc. de Recherches et d'Exploitations Pétrolifères), relating to activating carbon, see Vol. XVI, p. 579; 269,547 (I. G. Farbenindustrie, Akt.-Ges.), relating to unsaturated gaseous hydro-carbons and mixtures of carbon monoxide and hydrogen, see Vol. XVI, p. 605; 274,894 (I. G. Farbenindustrie Akt.-Ges.), relating to carboxylic acids of acenaphthene, see Vol. XVII, p. 311; 278,324 (I. G. Farbenindustrie Akt.-Ges.), relating to acetaldehyde from gaseous mixtures containing acetylene, see Vol. XVII, p. 515; 282,814 (I. G. Farbenindustrie Akt.-Ges.), relating to liquid hydro-carbons from destructive distillation of tars, mineral oils, etc., see Vol. XVIII, p. 224.

International Specifications not yet Accepted

283,467-8. DYES. R. Vidal, 10, Rue de la Comète, Asnières, Seine, France. International Convention date, January 8, 1927.

283,467. Nitroso compounds of phenol, *o*- and *m*-cresol, α - and β -naphthol, and dimethyl-aniline are reduced by means of sodium monosulphide, and the products separated by means of ammonium chloride. Nitroso-phenols, -naphthols, and -dimethyl-aniline are condensed with phenols or aromatic amines, and the products separated by means of ammonium salts, *e.g.*, ammonium chloride or sulphate. Both the amino compounds and the condensation products may be fused with sulphur to obtain sulphuretted dyes.

283,468. Di- or tri-nitrophenol is added to a solution of sodium monosulphide and the reduction completed by heating. The mixture is cooled and nitrosolphenol or nitroso-*o*- or *m*-cresol added, and again heated and refluxed with alkali polysulphide. Sulphur black dye is obtained by diluting, oxidising, and precipitating with an ammonium salt.

283,499. CATALYTIC PROCESSES. Compagnie de Bethune, Bully-les-Mines, Pas-de-Calais, France. International Convention date, January 11, 1927.

The temperature of the reaction in exothermic reactions such as the synthesis of methanol is controlled by adding a volatile liquid such as water. The liquid is injected into the gas mixture just before it enters the catalyst.

283,509. ALUMINA. J. C. Seailles, 280, Boulevard Raspail Paris. International Convention date, January 11, 1927. Addition to 277,697.

Specification 277,697 (see THE CHEMICAL AGE, Vol. XVII, p. 467), describes the treatment of a mixture of aluminium ore and an alkaline earth base with hot or cold water to obtain a hydrated alkaline earth aluminate. In this invention the base and alumina are in the molecular proportions of 4 : 1, with an additional 2 or 3 molecules of base for 1 of silica in the ore. The product, such as calcium aluminate, is washed to separate lime, and treated with caustic soda and carbon dioxide to obtain sodium aluminate, from which alumina can be obtained.

283,510. ACRIDINE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 11, 1927.

A nitro-9-chloracridine is condensed with a base containing at least two nitrogen atoms, of which one is a primary one, or a nitro-9-chloracridine containing a basic group is condensed with ammonia or a primary or secondary amine. The products are bactericides. In an example, 2-ethoxy-6-nitro-9-chloracridine is heated with phenol and the resulting 9-phenyl ether is condensed with *as*-diethyl-ethylenediamine to obtain 2-ethoxy-6-nitro-9-(β -diethylamino-ethylamino)-acridine. Many other examples are given, and also particulars of the preparation of the starting substances.

283,545. OBTAINING OILS, ETC., FROM COAL, ETC. I.G. Farbenindustrie Akt.-Ges., Frankfurt-on-Main, Germany. International Convention date, January 13, 1927. Addition to 282,691. (See THE CHEMICAL AGE, Vol. XVIII, p. 184.)

Coal and other carbonaceous solids are treated with hydro-carbons or their derivatives boiling mainly between 100°–300° C., and containing substantially no constituents boiling below 100° C. Pressures above 75 atmospheres are employed up to 1,000 atmospheres, and temperatures below the coking temperature of the oil, *e.g.*, 300°–400° C. The products may be worked up into Diesel oils, lubricating oils, etc. Suitable extracting agents are xylene, cresol, hydrogenated naphthalenes, aniline, and various synthetic and other oils. The products may be hydrogenated to obtain middle oils, benzene, etc.

283,558. FERTILISERS; MAGNESIUM SALTS. F. G. Liljenroth, 14, Eriksbergsgatan, Stockholm. International Convention date, January 15, 1927.

Materials containing soluble magnesium salts such as kieserite, kainite, etc., are treated in solution with ammonia and carbon dioxide to precipitate magnesium carbonate and form a soluble ammonium salt. Carbon dioxide is recovered from the precipitate by treating with nitric acid. Fertilisers containing ammonium sulphate, potassium and sodium chlorides, ammonium nitrate and phosphate are obtained.

283,569. PURIFYING TARS AND TAR OILS. J. Karpati, 15, Debroy Ut, Budapest, and M. G. Hubsch, 48, Csengery-utca, Budapest. International Convention date, January 15, 1927.

Tars, tar oils, and derivatives are treated with methyl, ethyl, or propyl alcohol, acetone, formaldehyde, or acetaldehyde, diluted with water, and at a temperature of 90°–150° C. and pressure of 1.5–6 atmospheres. The treatment is effected in an autoclave with agitation, and the mixture is then allowed to settle into two layers. The solvent containing the phenols is drawn off and cooled, and separates into two layers, one being the phenols, and the other the solvent which can be used again. By effecting the process fractionally, the different phenols can be obtained separately.

283,576. PYRIDINE DERIVATIVES. Schering - Kahlbaum Akt.-Ges. (formerly Chemische Fabrik Auf Actien, vorm. E. Schering), 170, Müllerstrasse, Berlin. International Convention date, January 14, 1927.

The chlorido compounds of 2-aminopyridines described in specification 264,508 (see THE CHEMICAL AGE, Vol. XVI, p. 317) are treated with alkali to obtain 2-amino-5-iodopyridines. Examples are given of the production of 5-iodo-2-amino-2-ethylamino-, -2-isopropylamino-, -2-isomethyl-amino-, and -2-diethylamino-pyridine, also 5-iodo-2-amino-6-methyl-3-ethylpyridine.

283,577. QUINOLINE DERIVATIVES. Schering - Kahlbaum Akt.-Ges. (formerly Chemische Fabrik Auf Actien, vorm. E. Schering), 170, Müllerstrasse, Berlin. International Convention date, January 14, 1927.

Aniline or its derivatives are condensed with alkyl- β -halogen-ethylketones obtained as described in specification 282,412 (see THE CHEMICAL AGE, Vol. XVIII, p. 183) in acid, neutral, or alkaline solution, in presence of an oxidising agent such as nitrobenzene or arsenic acid, to obtain 4-alkylquinolines. Examples are given of the production of 4-methylquinoline, 6-methoxyepidine, 6-ethoxyepidine, 6-nitroepidine, 6-chloroepidine, lepidine-8-carboxylic acid, and 4-ethylquinoline.

LATEST NOTIFICATIONS.

- 286,284. Catalysts of high mechanical strength. I.G. Farbenindustrie Akt.-Ges. March 3, 1927.
 280,292. Spinning artificial silk. I.G. Farbenindustrie Akt.-Ges. March 4, 1927.
 286,302. Machinery for softening or breaking fibrous materials. I.G. Farbenindustrie Akt.-Ges. March 4, 1927.
 286,602. Manufacture and production of vat dyestuffs of the dibenzanthrone series. I.G. Farbenindustrie Akt.-Ges. December 14, 1925.
 286,603. Process of and apparatus for making bands of artificial fibres. I.G. Farbenindustrie Akt.-Ges. March 5, 1927.
 286,252. Manufacture of water-soluble or emulsifiable products from wool fat. I.G. Farbenindustrie Akt.-Ges. March 1, 1927.
 286,272. Process for the manufacture of synthetic rubber. I.G. Farbenindustrie Akt.-Ges. March 2, 1927.
 286,274. Manufacture of azo-dyestuffs insoluble in water. I.G. Farbenindustrie Akt.-Ges. March 2, 1927.
 286,275. Manufacture of yarn from artificial and natural silk fibre. I.G. Farbenindustrie Akt.-Ges. March 2, 1927.
 286,309. Processes for preparing catalytic gels. Silica Gel Corporation. March 3, 1927.

Specifications Accepted with Date of Application

- 261,787. Catalytic chemical processes, Methods for carrying out. J. Trautmann. November 21, 1925.
 264,476. Distillation of oils occurring in the petroleum tar and similar industries, more particularly for the production of lubricants. L. Steinschneider. January 15, 1926.
 264,827. Unsaturated hydrocarbons, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. January 19, 1926.
 264,867. Phosphates or phosphate-containing substances decomposed by sulphuric acid, Method of treating. Stockholms Superfosfat Fabriks Aktiebolag. January 23, 1926.
 265,167. Derivatives of 2-amino-pyridine, Manufacture of. Shering Kahlbaum Akt.-Ges. (formerly Chemische Fabrik auf Actien (vorm. E. Schering)). January 27, 1926.
 265,960. Primary Aliphatic and cyclic amines, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. February 7, 1926.
 267,958. Cracking hydrocarbon oils or their distillates by distillation under pressure. S. Stransky and F. Hansgirk. March 18, 1926.
 271,440. Soluble hydrates of the alkali metals, Method of producing. A. F. Meyerhofer. May 19, 1926.
 275,144. Ores, Process of reducing. H. Wittek. July 27, 1926. Addition to 274,803.
 275,223. Electrical depositing of chromium. Siemens and Halske Akt.-Ges. July 27, 1926.
 278,390. Condensation products from urea, thiourea, or their derivatives and an alcohol or ketone, Manufacture of. I.G. Farbenindustrie Akt.-Ges. October 4, 1926.
 278,700. Purification of illuminating gas. Soc. du Gaz de Paris. October 11, 1926.
 278,723. Metallic beryllium or its alloys, Manufacture of, by means of the electrolysis of a molten mass. Siemens and Halske Akt.-Ges. October 7, 1926.
 279,870. Alumina, Production of. Metallbank und Metallurgische Ges. Akt.-Ges. October 26, 1926.
 280,530. Purifying magnesium and high percentage magnesium alloys. I.G. Farbenindustrie Akt.-Ges. November 13, 1926. Addition to 182,948 and 219,287.
 281,650. Preparing 2-chloropyridine. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler. December 3, 1926.
 282,023. Dissociating zirconium ores. Rhenania-Kunheim Verein Chemische Fabriken Akt.-Ges. December 13, 1926.
 285,932. Substituted guanidines, Manufacture of. K. Carpmæl and K. S. Carpmæl. (*Chemische Fabrik auf Actien (vorm. E. Schering)*). October 16, 1926.
 285,999. Simultaneous absorption of ammonia and hydrogen sulphide from industrial gases. K. Carpmæl and K. S. Carpmæl. (*I.G. Farbenindustrie Akt.-Ges.*). November 26, 1926.
 286,005. Indophenols and leuco-indophenols and new dyestuffs therefrom, Manufacture of. K. Carpmæl and K. S. Carpmæl. (*I.G. Farbenindustrie Akt.-Ges.*). November 27, 1926.
 286,067. Synthetic pig iron, Production of. Aktieselskapet Norsk Staal (Elektrisk Gas Reduction), and E. Edwin. February 12, 1927.
 286,087. Polyamino compounds, Manufacture of. K. Carpmæl and K. S. Carpmæl. (*I.G. Farbenindustrie Akt.-Ges.*). November 19, 1926. Addition to 267,169.
 286,123. Catalysts, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 6, 1927. Addition to 281,218.
 286,152. Mercaptans of the furfuryl series, Process of producing. E. C. R. Marks. (*Internationale Nahrungs und Genussmittel Akt.-Ges.*). July 25, 1927.
 286,172. Potassium carbonate and other potassium salts, Manufacture of. J. H. Bregeat. September 22, 1927.

- 286,196. Guanidine derivatives, Manufacture of. K. Carpmæl and K. S. Carpmæl. (*Chemische Fabrik auf Actien (vorm. E. Schering)*). October 16, 1926. Addition to 285,932.

Applications for Patents

- Carpmæl, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of azo-dyestuffs. 7,131. March 7.
 Carpmæl, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of chlorinated benzene compounds. 7,359. March 9.
 Clark, P. G., and Wooldridge, H. B. Decolorising and purification of saccharine materials. 6,987. March 6.
 Coley, H. E. Treatment of ores, etc. 7,365. March 9.
 Coley, H. E. Manufacture of zinc. 7,366. March 9.
 Crawford, J. W. C., and Scharff, G. E. Preparation of pigments, etc. 7,406. March 9.
 Hofmann, F. Polymerisation of olefines. 6,878. March 5.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Yeast cultivation. 7,231. March 8.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of dehydration catalysts. 7,232. March 8.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of complex tungsten and molybdenum compounds. 7,362. March 9.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Carbonisation of bituminous, etc., materials. 7,363. March 9.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of fertilisers. 7,496. March 10.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of acetaldehyde from acetylene, etc. 7,497. March 10.
 I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of hydrocarbons. 7,498. March 10.
 I.G. Farbenindustrie Akt.-Ges. Manufacture of 6-nitro-2-amino-1-benzoic acid, etc. 6,983. March 6. (Germany, March 9, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of condensation products of pyrenequinone series. 6,984. March 6. (Germany, March 12, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs of pyrenequinone series. 7,147. March 7. (Germany, March 26, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of indigoid vat dyestuffs. 7,241. March 8. (Germany, November 5, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of 1-methyl-2:5-dichloro-4-amino-benzene. 7,242. March 8. (Germany, March 15, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Photographic roll films. 7,243. March 8. (Germany, October 8, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of hydrocarbons. 7,326, 7,327, 7,337, 7,338. March 9. (Germany, September 10, 1925.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of organic bases. 7,392. March 9. (Germany, September 2, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Manufacture of photographic anti-halation plates, etc. 7,393. March 9. (Germany, June 29, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Magnesium, etc., alloys. 7,423. March 9. (Germany, March 19, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Nitrocellulose lacquers, etc. 7,485. March 10. (Germany, March 16, 1927.)
 I.G. Farbenindustrie Akt.-Ges. Production of photographic prints, etc. 7,490. March 10. (Germany, March 10, 1927.)
 Imperial Chemical Industries, Ltd. Effecting gaseous dehydrating reactions. 6,783. March 5.
 Imperial Chemical Industries, Ltd. Detonators. 7,257. March 8.
 Imperial Chemical Industries, Ltd. Plastics, etc. 7,258. March 8.
 Imperial Chemical Industries, Ltd. Preparation of pigments, etc. 7,406. March 9.
 International Fireproof Products Corporation. Chlorinating hydrocarbons. 7,189. March 8. (United States, March 11, 1927.)
 Laing, B., and Nielsen, H. Distillation of carbonaceous materials. 6,802. March 5. (May 18, 1927.)
 Laing, B., and Nielsen, H. Distillation of carbonaceous materials. 6,803. March 5. (February 21, 1927.)
 Laing, B., and Nielsen, H. Distillation of carbonaceous materials. 6,804. March 5. (December 4, 1926.)
 Schieferwerke Ausdauer Akt.-Ges. Method of producing hexamethyltetramine. 7,416. March 9. (Germany, March 10, 1927.)

Glass Laboratory Apparatus

FROM Wood Brothers Glass Co., Ltd., Barnsley, has been received a comprehensive list of different forms of laboratory apparatus made in glass. This list covers a wide range including beakers, bottles, flasks, dishes, rod and tubing, absorption and gas analysis apparatus and volumetric apparatus. Included also is a list dealing with "Schola" beakers and flasks, made specially to suit the requirements of students and others who do not require the highest grade but need a good serviceable glassware.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.
 ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.
 ACID HYDROCHLORIC.—38.9d. to 6s. per carboy d/d, according to purity strength, and locality.
 ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.
 ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
 AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.
 BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra.
 BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.
 BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)
 CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.
 COPPER SULPHATE.—£25 to £25 10s. per ton.
 METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity as from March 1, 1928.
 NICKEL SULPHATE.—£38 per ton d/d.
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
 POTASH CAUSTIC.—£30 to £33 per ton.
 POTASSIUM BICHROMATE.—44d. per lb.
 POTASSIUM CHLORATE.—34d. per lb., ex wharf, London, in cwt. kegs.
 SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.
 SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.
 SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.
 SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.
 SODIUM ACETATE 97/98%.—£21 per ton.
 SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.
 SODIUM BICHROMATE.—34d. per lb.
 SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.
 SODIUM CHLORATE.—24d. per lb.
 SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.
 SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.
 SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.
 SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.
 SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.
 SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 7½d. per lb. Crude 60's, 2s. 3d. to 2s. 4d. per gall. prompt.
 ACID CRESYLIC 99/100.—2s. 11d. to 3s. per gall. 97/99.—2s. 6d. to 2s. 7d. per gall. Pale, 95%, 2s. 5d. to 2s. 6d. per gall. Dark, 95%, 2s. 2d. to 2s. 3d.
 ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.
 ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.
 BENZOLE.—Prices at works; Crude, 8½d. to 9d. per gall.; Standard Motor, 1s. 1d. to 1s. 2d. per gall.; 90%, 1s. 2d. to 1s. 3d. per gall.; Pure, 1s. 5d. to 1s. 6d. per gall.
 TOLUOLE.—90%, 1s. 4d. to 1s. 8d. per gall. Firm. Pure, 1s. 6d. to 1s. 10d. per gall.
 XYLOL.—1s. 3d. to 1s. 7d. per gall. Pure, 2s. 4d. per gall.
 CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 7½d. to 8½d. per gall. Heavy, 8½d. to 8½d. per gall. Standard specification, 7½d. to 7½d. ex works. Salty, 7½d. per gall.
 NAPHTHA.—Crude, 7½d. to 8d. per gall. Solvent 90/160, 10d. to 10½d. per gall. Solvent 95/160, 1s. 3d. to 1s. 4d. per gall. Solvent 90/190, 9½d. to 1s. 2d. per gall.
 NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed or hot pressed, £8 per ton.
 NAPHTHALENE.—Crystals, £13 to £13 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.
 PITCH.—Medium soft, 60s. to 70s. per ton, f.o.b., according to district. Nominal.
 PYRIDINE.—90/140, 5s. 6d. to 7s. per gall. 90/180, 3s. to 5s. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:
 ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
 ACID ANTHRANILIC.—6s. per lb. 100%.
 ACID BENZOIC.—1s. 8½d. per lb.
 ACID GAMMA.—4s. 6d. per lb.
 ACID H.—3s. per lb.
 ACID NAPHTHIONIC.—1s. 6d. per lb.
 ACID NEVILLE AND WINTHER.—4s. 9d. per lb.
 ACID SULPHANILIC.—8½d. per lb.
 ANILINE OIL.—8d. per lb. naked at works.
 ANILINE SALTS.—8d. per lb. naked at works.
 BENZALDEHYDE.—2s. 3d. per lb.
 BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.
 BENZOIC ACID.—1s. 8½d. per lb.
 o-CRESOL 29/31° C.—5½d. per lb.
 m-CRESOL 98/100%.—2s. 3d. to 2s. 5d. per lb.
 p-CRESOL 32/34° C.—2s. 3d. to 2s. 5d. per lb.
 DICHLORANILINE.—2s. per lb.
 DIMETHYLANILINE.—1s. 11d. per lb.
 DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.
 DINITROCHLOROBENZENE.—£84 per ton d/d.
 DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.
 DIPHENYLAMINE.—2s. 10d. per lb. d/d.
 a-NAPHTHOL.—2s. per lb. d/d.
 B-NAPHTHOL.—10d. per lb. d/d.
 a-NAPHTHYLAMINE.—1s. 3d. per lb.
 B-NAPHTHYLAMINE.—3s. per lb.
 o-NITRANILINE.—5s. 9d. per lb.
 m-NITRANILINE.—3s. per lb. d/d.
 p-NITRANILINE.—1s. 8d. per lb.
 NITROBENZENE.—6d. per lb. naked at works.
 NITRONAPHTHALENE.—1s. 3d. per lb.
 R. SALT.—2s. 2d. per lb.
 SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.
 o-TOLUIDINE.—8d. per lb.
 p-TOLUIDINE.—2s. 1d. per lb. naked at works.
 m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.
 N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand.
 Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.
 CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.
 IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.
 RED LIQUOR.—9d. to 10d. per gall.
 WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.
 WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.
 WOOD TAR.—£4 to £5 per ton.
 BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.
 ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.
 BARYTES.—£3 10s. to £6 15s. per ton, according to quality.
 CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.
 CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.
 CARBON BLACK.—5½d. per lb., ex wharf.
 CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.
 CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.
 DIPHENYLGUANIDINE.—3s. 9d. per lb.
 INDIA RUBBER SUBSTITUTES, WHITE AND DARK.—5½d. to 6½d. per lb.
 LAMP BLACK.—£35 per ton, barrels free.
 LEAD HYPOSULPHITE.—9d. per lb.
 LITHOPHON, 30%.—£22 10s. per ton.
 MINERAL RUBBER "RUBPRON".—£13 12s. 6d. per ton, f.o.r. London.
 SULPHUR.—£9 to £11 per ton, according to quality.
 SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
 SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.
 THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.
 THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.
 VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.
 ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.
 ACID, ACETYL SALICYLIC.—2s. 5d. to 2s. 7d. per lb.
 ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity.
 Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—2s. to 2s. 2d. per lb. Both less 5%

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.

ACID, SALICYLIC, B.P. PULV.—1s. 2d. to 1s. 3d. per lb.; Technical.—11½d. to 11¾d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 4½d. per lb., less 5%.

ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.

AMIDOL.—7s. 6d. to 9s. per lb., d/d.

AMIDOPYRIN.—8s. to 8s. 3d. per lb.

AMMONIUM BENZOATE.—3s. to 3s. 3d. per lb., according to quantity. 18s. per lb. ex Gum.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimed, 1s. per lb.

ATROPINE SULPHATE.—9s. per oz.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—11s. 4d. to 11s. 7d. per lb.

BISMUTH CITRATE.—10s. 4d. to 10s. 7d. per lb.

BISMUTH SALICYLATE.—10s. 7d. to 10s. 10d. per lb.

BISMUTH SUBNITRATE.—9s. 7d. to 9s. 10d. per lb.

BISMUTH NITRATE.—6s. 7d. to 6s. 10d. per lb.

BISMUTH OXIDE.—14s. 7d. to 14s. 10d. per lb.

BISMUTH SUBCHLORIDE.—14s. 4d. to 14s. 7d. per lb.

BISMUTH SUBGALLATE.—8s. 7d. to 8s. 10d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.

BISMUTH ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 1½d. per lb.; 12 W. Qts. 1s. 0½d. per lb.; 36 W. Qts., 1s. per lb.

BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Ammonium, 2s. to 2s. 1d. per lb.; potassium, 1s. 8½d. to 1s. 9½d. per lb.; sodium, 1s. 11d. to 2s. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.

CALCIUM LACTATE.—1s. 2d. to 1s. 3d. per lb.

CAMPOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHERS.—S.G. 730—1s. 0½d. to 1s. 1½d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.

HEXAMINE.—2s. 3d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.

HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE.—B.P., 2s. 5d. to 2s. 8d. per lb. Green, 2s. 8d. to 3s. 1d. per lb.; U.S.P., 2s. 6d. to 2s. 9d. per lb.

IRON FERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.

MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.

MENTHOL.—A.B.R. recrystallised B.P., 16s. 6d. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.

MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10s. to 5s. 11d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.

METHYL SULPHONAL.—9s. to 9s. 3d. per lb.

METOL.—9s. to 11s. 6d. per lb. British make.

PARA-FORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.

PHENACETIN.—2s. 6d. to 2s. 9d. per lb.

PHENAZONE.—4s. to 4s. 3d. per lb.

PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—102s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P.C., 2s. 5d. to 2s. 6d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.

RESORCIN.—2s. 10d. to 3s. per lb., spot.

SACCHARIN.—55s. per lb.; in quantity lower.

SALOL.—2s. 4d. per lb.

SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 10d. to 2s. 1d. per lb., B.P.C., 1923—2s. 2d. to 2s. 3d. per lb. for 1-cwt. lots. U.S.P., 2s. 1d. to 2s. 3d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb., carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 7d. to 1s. 9d. per lb. Crystal, 1s. 7½d. to 1s. 10d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.

SULPHONAL.—6s. 9d. to 7s. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. to 2s. 3d. per lb.

THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer, Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—11s. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL SALICYLATE.—2s. 9d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 9d. per lb.

CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.

COUMARIN.—10s. per lb.

CITRONELLOL.—13s. 6d. per lb.

CITRAL.—8s. 3d. per lb.

ETHYL CINNAMATE.—6s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—8s. 3d. per lb.

GERANIOL (PALMAROSA).—20s. per lb.

GERANIOL.—6s. to 10s. per lb.

HELIOTROPINE.—4s. 6d. per lb.

ISO EUGENOL.—13s. per lb.

LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.

LINALYL ACETATE.—Ex Bois de Rose, 8s. 6d. per lb. Ex Shui Oil, 14s. 6d. per lb.

METHYL ANTHRANILATE.—8s. 6d. per lb.

METHYL BENZOATE.—4s. per lb.

MUSK KETONE.—35s. per lb.

MUSK XYLOL.—7s. per lb.

NEROLIN.—4s. 6d. per lb.

PHENYL ETHYL ACETATE.—11s. per lb.

PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.

RHODINOL.—32s. 6d. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 8d. per lb.

VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.

ANISE OIL.—2s. 9d. per lb.

BERGAMOT OIL.—24s. 6d. per lb.

BOURBON GERANIUM OIL.—14s. 6d. per lb.

CAMPOR OIL.—9d. per lb.

CANANGA OIL, JAVA.—12s. 9d. per lb.

CINNAMON OIL LEAF.—6s. 9d. per lb.

CASSIA OIL, 80/85%.—8s. 3d. per lb.

CITRONELLA OIL.—Java, 1s. 10d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 9d. per lb.

CLOVE OIL.—5s. 6d. per lb.

EUCALYPTUS OIL, AUSTRALIAN.—2s. 1d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%. Esters, 15s. 9d. per lb.

LEMON OIL.—9s. 6d. per lb.

LEMONGRASS OIL.—4s. 3d. per lb.

ORANGE OIL, SWEET.—13s. per lb.

OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 62s. 6d. per * oz.

PALMA ROSA OIL.—12s. 6d. per lb.

PEPPERMINT OIL.—Wayne County, 15s. 9d. per lb.; Japanese, 7s. 3d. per lb.

PETITGRAIN.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

LONDON, March 15, 1928.

THERE has been quite a fair volume of trade passing during the current week, and on the whole prices continue without change. Export trade has been fairly active and a fair amount of inquiry has been noted.

General Chemicals

ACETONE continues steady and in good demand at £64 to £66 per ton.
ACID ACETIC remains unchanged at £37 to £38 per ton, and at these figures is extremely firm.
ACID CITRIC is unchanged with a nominal market of 1s. 11d. per lb., less 5%.
ACID FORMIC.—Demand remains fair at £47 for 85%.
ACID LACTIC is a firm spot at £43 per ton for 50% by weight for pale quality.
ACID OXALIC is extremely firm with a good demand at £30 10s. per ton.
ACID TARTARIC.—The position continues firm with price unchanged at 1s. 4½d. to 1s. 5d. per lb. The demand, however, is somewhat small.
ALUMINA SULPHATE continues in good demand and price is firm at £5 15s. to £5 17s. 6d. per ton, for 17/18%.
AMMONIUM CHLORIDE.—Only a fair business is reported at round about £19 per ton.
ARSENIC.—Unchanged.
BARIUM CHLORIDE continues steady at £8 8s. per ton.
COPPER SULPHATE is firm, but without change in price.
CREAM OF TARTAR.—Supplies continue short, with a good demand. The price remains at round about £100 for B.P. and higher prices are anticipated in the near future.
EPSOM SALTS.—Unchanged.
FORMALDEHYDE.—In good demand at £40 per ton.
LEAD ACETATE has improved in demand somewhat, but price is unchanged at £42 per ton for white, with £1 per ton less for brown.
LIME ACETATE.—Unchanged.
METHYL ACETONE.—Demand is fair at £55 per ton for 40/45%.
POTASSIUM CARBONATE AND CAUSTIC.—Unchanged.

POTASSIUM CHLORATE.—Demand continues good with price unchanged at £29 to £30 per ton.
POTASSIUM PERMANGANATE.—Here, again, the improved demand has continued and price is very steady at 5½d. per lb.
POTASSIUM PRUSSATE.—Demand is improving, with price unchanged at £59 to £63 per ton, according to quantity.
SODIUM ACETATE.—Supplies continue extremely short and price is again firmer at £21 10s. to £22 per ton.
SODIUM BICHROMATE.—Unchanged.
SODIUM CHLORATE is moderately active at £28 to £30 per ton.
SODIUM HYPOSULPHITE.—Unchanged at British makers' figures.
SODIUM NITRITE is firm at £20 10s. per ton, with a good demand.
SODIUM PHOSPHATE is higher at from £12 to £13 per ton, demand good.
SODIUM PRUSSATE.—Firm at 4½d. per lb.
SODIUM SULPHIDE.—Unchanged.
TARTAR EMETIC is firmer at 11½d. to 11¾d. per lb., with material in exceedingly short supply.
ZINC SULPHATE.—Unchanged at £14 per ton, with a fair demand.

Coal Tar Products

The market for coal tar products remains quiet, with little change to report in prices. There is a fair amount of inquiry, but not much material offering.

90's BENZOL is unchanged, at about 1s. 3d. to 1s. 4d. per gallon, while the motor quality is quoted at 1s. 1d. to 1s. 2d. per gallon.
PURE BENZOL is worth about 1s. 5½d. to 1s. 6½d. per gallon on rails.
CREOSOTE OIL is rather quiet, and can be bought at 7½d. per gallon on rails in the North, and at 8d. per gallon in London.
CRESYLIC ACID is unchanged, the 98/100% pale quality being quoted at 2s. 8d. per gallon, at works naked, and the dark quality 95/97% at 2s. 2d. per gallon.
SOLVENT NAPHTHA remains very weak, and can be bought at about 8d. per gallon on rails in the provinces.
HEAVY NAPHTHA is still in poor demand, and can be bought at 9d. to 9½d. per gallon on rails.
NAPHTHALENES are unchanged, the 74/76 quality being quoted at about £7 per ton, while the 76/78 quality is quoted at £8 to £8 10s. per ton.
PITCH is unchanged. The value remains 60s. to 65s., f.o.b. U.K. port.

Society of Public Analysts

Annual Election of Officers

THE annual general meeting of the Society was held at the Chemical Society's Rooms, Burlington House, London, on Wednesday, March 7, when the president (Mr. E. Richards Bolton) delivered his annual address.

The following were elected as officers and council for the year 1928:—President: Mr. Edward Hinks. Past presidents, serving on the Council: Messrs. E. Richards Bolton, A. Chaston Chapman, Bernard Dyer, P. A. Ellis Richards, Alfred Smetham, G. Rudd Thompson, E. W. Voelcker, J. Augustus Voelcker. Vice-presidents: Messrs. John Evans, Thomas Macara, John White. Hon. treasurer: Mr. E. B. Hughes. Hon. secretary: Mr. F. W. F. Arnaud. Members of Council: Messrs. A. P. Davson, J. Golding, J. T. Hewitt, E. V. Jones, R. Lessing, Andrew More, W. Partridge, E. K. Rideal, W. H. Roberts, C. A. Seyler, M. A. Salamon, and James Wood.

At an ordinary meeting that followed, certificates were read for the first time in favour of Messrs. F. R. Hill, B.Sc., A.I.C., E. T. Illing, B.Sc., F.I.C., F. Iskander, H. B. Marston, B.Sc., A.I.C., R. J. Munro, B.Sc., A.I.C., J. R. Nicholls, B.Sc., F.I.C., H. G. Reeves, D.Sc., Ph.D., F.I.C., G. Walsh, B.Sc., A.I.C., R. G. Warren, B.Sc., and W. A. Waygood, B.Sc., A.R.C.S., A.I.C.; and for the second time in favour of Messrs. J. E. Aps, E. E. Billington, M.Sc., R. C. Chirnside, and R. D. Owen, A.I.C., A.M.I.Chem.E. Messrs. A. R. Buchanan and A. G. Francis, B.Sc., F.I.C. were elected members.

Papers were read on "The composition of the fatty acids present as glycerides in Elasmobranch oils," by T. P. Hilditch, D.Sc., F.I.C., and A. Houlbrooke; "Behaviour of indicators in the titration of ammonia, sodium and calcium phosphates, the methylamines, pyridine bases and boric acid," by R. T. Thomson, F.I.C.; and "Cacao Tannin," by H. R. Jensen, M.Sc., F.I.C.

South Wales By-Products

SOUTH WALES by-product activities remain unchanged. Pitch appears to have reached a minimum standard and continues to change hands round about 62s. 6d. to 67s. 6d. per ton. Heavy and solvent naphtha is unchanged, with demand moderate. Crude tar has a good demand at from 50s. to 60s. per ton, f.o.b., while refined tars have a good and steady call, with values unchanged. Patent fuel and coke exports are slightly better. Patent fuel for export ranges from 21s. to 23s. per ton; coke (best foundry), from 32s. 6d. to 37s., and other sorts from 25s. to 32s. per ton. Oil imports into Swansea for the four weeks ending February 28 totalled 32, 240, 840 gallons.

Nitrogen Products

Export.—The demand in consuming countries has been quite satisfactory, and the price has remained firm at £10 to £10 2s. 6d. per ton f.o.b. U.K. port in single bags. There is very little interest in forward positions, but in view of the heavy consumption reported from several countries, it is not expected that the price will be much below that of June–August, 1927.

Home.—The home demand, according to reports from merchants in various parts of the country, will be little short of that of last year, despite the depression in agriculture. No doubt the lower price at which the fertiliser is selling has stimulated the demand. Keen buying is now reported from Scotland.

Nitrate of Soda.—The nitrate position remains unchanged. Consumption is down owing to the stocks in various countries, and there is still little demand for early shipment. The price remains steady at about 16s. 6d. per metric quintal f.a.s. Chile.

Egyptian Chemist Acquitted on Grave Charge

HASSAN MAMICH, chief chemist in the Public Prosecutor's Office, Cairo, who was arrested recently on a charge of alleged malpractices in connection with police seizures of suspicious drugs, has been acquitted. He was charged with substituting a harmless drug for the heroin captured by the police and thus producing a false analysis.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, March 14, 1928.

BUSINESS in the heavy chemical market has again been rather more active during the past week, export inquiry being the more prominent. Prices show little or no change.

Industrial Chemicals

- ACETONE, B.G.S.—£63 to £66 per ton, ex store, according to quantity.
- ACID ACETIC.—98/100%, glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80%, pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.
- ACID BORIC.—Crystals, granulated or small flakes, £30 per ton; powdered, £32 per ton, packed in bags, carriage paid U.K. stations.
- ACID CARBOLIC, ICE CRYSTALS.—Quoted 6½d. per lb., f.o.b. U.K. ports.
- ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality 5s. 6d. per carboy, ex works, full wagon loads.
- ACID NITRIC.—80% quality, £24 10s. per ton, ex station, full truck loads.
- ACID OXALIC, 98/100%.—On offer from the Continent at 3½d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.
- ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality 20s. per ton extra.
- ACID TARTARIC, B.P. CRYSTALS.—Now quoted 1s. 4½d. per lb., less 5%, ex wharf. Demand rather easier.
- ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material on offer at £5 15s. per ton, ex store. Quoted £5 5s. per ton, c.i.f. U.K. ports, prompt shipment.
- ALUM, LUMP POTASH.—Some spot material available at about £9 per ton, ex store. Crystal meal quoted £8 10s. per ton, ex store. Lump quality on offer from the Continent at £8 5s. per ton, c.i.f. U.K. ports.
- AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.
- AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.
- AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.
- AMMONIA MURIATE.—Grey galvanizers' crystals of British manufacture unchanged at £23 to £24 per ton, ex station. Continental on offer at £19 15s. per ton, c.i.f. U.K. ports. Fine white crystals quoted £17 10s. per ton, c.i.f. U.K. ports.
- ARSENIC WHITE POWDERED.—Quoted £19 7s. 6d. per ton, ex wharf, prompt despatch from mines. Spot material available at £20 5s. per ton, ex store.
- BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton, c.i.f. U.K. ports.
- BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.
- BLEACHING POWDER.—British manufacturers' contract price to consumers £6 12s. 6d. per ton, delivered, minimum 4-ton lots. Continental on offer at £6 10s. per ton, ex wharf.
- CALCIUM CHLORIDE.—British manufacturers' price £4 15s. per ton to £5 5s. per ton, ex station, according to quantity and point of delivery. Continental material quoted £3 12s. 6d. per ton, c.i.f. U.K. ports.
- COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton f.o.b. U.K. ports for export.
- COPPER SULPHATE.—Now on offer from the Continent at about £25 per ton, c.i.f. U.K. ports. British material quoted £26 per ton, ex store.
- FORMALDEHYDE, 40%.—Offered at £35 10s. per ton, c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.
- GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.
- LEAD, RED.—Imported material on offer at £31 per ton, ex store.
- LEAD, WHITE.—Quoted £31 10s. per ton, ex store.
- LEAD, ACETATE.—White crystals quoted £39 15s. per ton, c.i.f. U.K. ports. Brown, £38 10s. per ton, c.i.f. U.K. ports. Spot material on offer at £42 15s. per ton, ex store, spot delivery.
- MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.
- METHYLATED SPIRIT.—Industrial quality, 64 O.P., now quoted 2s. per gallon, delivered.
- POTASSIUM BICHROMATE.—4½d. per lb., delivered, minimum 4-ton lots. Under 4-ton lots ½d. per lb. extra.
- POTASSIUM CARBONATE, 96/98%.—Rather scarce for immediate delivery. Quoted £25 10s. per ton, ex wharf. Spot material about £26 10s. per ton, ex store.
- POTASSIUM CHLORATE, 99/100%.—Powdered material offered from the Continent at £25 10s. per ton, c.i.f. U.K. ports. Crystals 30s. per ton more.
- POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.
- POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.
- POTASSIUM PRUSSIAE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6½d. per lb.
- SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton; 70/72%, £13 12s. 6d. per ton, minimum 4-ton lots, carriage paid on contract. Spot material 10s. per ton extra.
- SODIUM ACETATE.—In good demand and spot material scarce. Quoted £20 5s. per ton, ex store.
- SODIUM BICARBONATE.—Refined crystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less. No change in price for next year.
- SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works, minimum 4-ton lots. Under 4- and over 2-ton lots, 3½d. per lb.; under 2-ton lots, 3½d. per lb.
- SODIUM CARBONATE (SODA CRYSTALS).—£3 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra.
- SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.
- SODIUM NITRATE.—Quoted £11 per ton, ex store.
- SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.
- SODIUM PRUSSIAE (YELLOW).—In moderate demand and price unchanged at about 4½d. per lb., ex store. Offered for prompt shipment from the Continent at 4½d. per lb., ex wharf.
- SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works, for unground quality, 52s. 6d. per ton, delivered. Ground quality, 2s. 6d. per ton extra.
- SODIUM SULPHIDE.—Prices now as follows:—Solid, 60/62, £9 per ton; broken, 60/62, £10 per ton. Crystals, 30/32%, £9 2s. 6d. per ton, delivered buyers' works, on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.
- SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; floristella, £9 10s. per ton; Ground American, £9 5s. per ton; ex-store prices nominal.
- ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports. 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered 20s. per ton extra.
- ZINC SULPHATE.—Continental material quoted £11 15s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Chemical Engineering Group Conferences

THE Committee of the Chemical Engineering Group regret that, owing to pressure of business in many directions and to the proximity of his departure for California, the Chairman, Professor E. C. Williams, finds himself unable to present his paper at the meeting in London arranged for Friday, March 23. The committee have, however, secured a paper on the important subject of "Ultra-Violet Radiation in Industry," which will be presented by Mr. Alfred A. King. As this will be the last public appearance of the Chairman in this country an appeal is made for a large attendance.

Alterations in the dates of the remaining two meetings of the session are announced. The joint meeting with the Birmingham Section will be held on April 20 instead of April 13. A visit is being arranged to the Industrial Research Laboratories of the Birmingham Gas Company, and a paper will be read by Dr. C. M. Walter dealing with "The Heat Treatment of Ferrous Metals." The annual general meeting and address by the President has been altered from May 4 to Friday, May 11, when it will constitute the opening of the important five days' London meeting of the Society of Chemical Industry.

Manchester Chemical Market

(FROM OUR OWN CORRESPONDENT.)

Manchester, March 15, 1928.

APART from one or two minor fluctuations in prices there have been few important changes in chemical products on the Manchester market since last report. Delivery specifications against contracts are reported to be flowing in fairly satisfactorily but, as before, current transactions in chemical products on the open market are largely a matter of the part of consumers of filling early requirements. With regard to overseas trade, shipments of heavy chemicals continue from here, primarily for the Dominions and the East.

Heavy Chemicals

A rather quiet demand is about for phosphate of soda but offers of this keep steady at from £12 to £12 10s. per ton. In the case of bichromate of soda, movements are on a fairly satisfactory scale and up to 3½d. per lb. is being currently quoted. Only a comparatively small trade is passing in chlorate of soda and although at 2½d. to 3d. per lb. prices show little change on the week the tendency is rather easy. Some inquiry for hyposulphite of soda has been reported, with commercial quality at about £9 5s. per ton, and photographic at up to £16 10s. Caustic soda is well held at from £13 2s. 6d. to £15 2s. 6d. per ton, according to quality, and the demand for this material is on quietly steady lines. Prussiate of soda is steady and meets with a moderate amount of enquiry at about 4½d. per lb. There has been a shade more activity in the case of sulphide of sodium, current values of which are at round £7 10s. per ton for the commercial grade and £9 10s. for the 60-65 per cent. concentrated solid. Bicarbonate of soda is well held at the recent level of £10 10s. per ton for contract orders and a fair volume of business is reported. There is no change in the position of bleaching powder, a moderate demand being met with on the basis of £7 per ton. Saltcake is still a relatively quiet section of the market but makers' offers are still at £2 12s. 6d. per ton. Alkali is maintained at about £6 2s. 6d. per ton and fair quantities of this are moving into consumption. With regard to nitrate of soda there is a moderate enquiry about for this material and current quotations range from £19 to £19 10s. per ton, according to quantity.

The demand this week for chlorate of potash has continued within comparatively narrow limits but there has been no alteration in prices, these still being in the neighbourhood of 3d. per lb. Carbonate of potash is fairly steady at about £25 5s. per ton, and a moderate business is being put through. Sales of caustic potash are not unsatisfactory and prices keep firm at £33 5s. per ton for prompt delivery of one to five-ton lots. Enquiry for permanganate of potash is on the slow side and quotations are easy, with B.P. at about 5½d. per lb. and commercial quality at 4½d. Bichromate of soda is steady and in fair demand at 4½d. per lb. Yellow prussiate of potash is in rather limited request but prices are about unchanged at 6½d. per lb.

There is still a fair trade being put through in the case of sulphate of copper at a firm range of prices, offers being at round £26 15s. per ton, f.o.b. The demand for arsenic is quiet at from £17 to £17 5s. per ton, on rails, for white powdered, Cornish makes. There is not much business passing in nitrate of lead, but values are still at about £37 per ton. Acetate of lead is somewhat steadier at £40 10s. per ton for white, and about £38 15s. for brown, though the demand is still comparatively unimportant. Offers of acetate of lime this week has been at round £16 per ton for grey and about £10 5s. for brown.

Acids and Tar Products

A moderate business is being put through in oxalic acid, quotations for which are well held at from 3½d. to 3¾d. per lb. A quietly steady trade is reported in acetic acid at firm prices, glacial being quoted at round £66, and 80 per cent. commercial at £37 10s. per ton. Citric acid continues very strong at up to 1s. 11d. per lb., and tartaric at about 1s. 4½d. per lb., and in both cases a fair amount of buying interest is being shown.

Pitch is about maintained on the week at £3 per ton, f.o.b., but the export movement is relatively unimportant. Carbolic acid is steady and in moderate request at round 6½d. per lb., offers of crude quality being made at from 2s. 3½d. to 2s. 4d. per gallon. Between 7½d. and 7¾d. per gallon is being quoted here for creosote oil, the demand for which keeps up at a fairly satisfactory level. Solvent naphtha is quiet but unchanged at 10½d. per gallon.

Company News

HADFIELDS, LTD.—The payment of a dividend of 5 per cent. is announced, being double that paid a year ago.

PINCHIN, JOHNSON AND CO.—The net profits for the year to December 31 last were £327,942, as compared with £148,330 in 1926.

AGUAS BLANCAS NITRATE CO., LTD.—A meeting of the debenture holders was held on Monday at River Plate House, London, E.C.2, when a scheme of reconstruction was unanimously approved.

PARKES CHEMISTS.—The company announce the payment on March 20 of a final dividend on the preference shares for the half-year ended February 29, 1928, at the rate of 6 per cent. per annum, less income-tax.

DOMINION TAR AND CHEMICAL CO.—Subject to the approval of the shareholders, the directors propose to pay a final dividend on the ordinary shares of 6½ per cent. (less income tax at 2s. 2d.) and a bonus of 2½ per cent. (less tax at 2s. 2d.), making a total for the year of 14½ per cent., less tax.

SNIA VISCOSA.—The 1927 report shows net earnings of 46,000,000 lire. The board has decided to put the report on a gold lira basis and declare no dividend. Share value is to be reduced from 150 lire to 120 lire, thus reducing the capital to 800,000,000 lire. The capital is to be increased to 1,000,000,000 lire by the issue of shares of 150 lire each.

BRITISH ALUMINIUM CO.—The net profits for the year ended December 31, 1927, work out at approximately £279,368, as compared with £279,676 for 1926. After providing for the dividend on the preference shares and for the interim dividend of 4 per cent. on the ordinary shares, the directors recommend a final dividend of 6 per cent., making 10 per cent. for the year, the same as for 1926, leaving £27,857 to be carried forward.

SALT UNION.—The net profits for the year 1927 are £265,077, an increase of £47,512 on the previous year. The sum of £35,000 is placed to contingencies account, which last year received nothing, and the staff superannuation fund is again increased by £1,000. The amount carried forward of £36,737, is £16,780 larger than a year ago. It is proposed to pay a dividend of 2s. 4d. per share on the preference shares, and a dividend of 2s. 6d. on the ordinary shares. The annual meeting will be held at Liverpool on March 20, at 12 noon.

INTERNATIONAL PAINT AND COMPOSITIONS CO.—After writing off bad debts, the profit for the year ended December 31 last amounted to £86,001. After deducting provision for income tax, £17,000, tax deducted from dividends, £7,915, and provision for depreciation, £6,614, there remains £70,302, to which is added the sum of £15,105 brought in, making £85,407. The directors recommend placing to reserve fund £30,740 and a 4 per cent. final dividend on the ordinary shares, making 7 per cent. for the year, and carrying forward £13,791.

UNITED GLASS BOTTLE MANUFACTURERS.—The report for year 1927 shows that the profits amount to £77,230, to which is added £33,621 brought forward. After providing for dividend for the half-year on the 7½ per cent. preference shares there remains £92,858. The directors have transferred £20,000 to special depreciation in respect of capital reorganisation, £8,436 to debenture redemption reserve, and £3,500 to staff benevolent fund, and, after providing for final dividend on the 7½ per cent. preference shares, there remains £42,928 to be carried forward. The directors report satisfactory improvement in profits, but they consider that the additions made to the reserves a sounder policy than recommending a dividend on the ordinary shares.

BRITON FERRY CHEMICAL AND MANURE CO.—For the year ended December 31, 1927, the report states that after charging £10,000 for depreciation and £4,599 for dividend on preference shares, and transferring £1,739 to reserve account, there remains a credit balance at the profit and loss account, including a balance from the previous year, of £8,302. The directors recommend the payment on March 24 of a dividend of 1s. per share, less income-tax, on the ordinary shares, to the shareholders on the books on March 6. In connection with the Briton Ferry Acid Works, the directors state that negotiations were successfully concluded during the year for the purchase of the head lease with a term of 890 years unexpired. The annual meeting will be held at 9, Queen Street Place, London, on March 20, at 2 p.m.

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COMBATING CORROSION

IF, in the machinery you build or operate, there is one single part which is exposed to the corroding influences of moisture, chemicals, food acids or hot gases—if that one detail corrodes, and in corroding, weakens, loses efficiency, leaks or contaminates your product—that one part would be better made from

FIRTH "STAYBRITE"

—the super malleable, super rustless steel.

Firth "Staybrite" is obtainable in the form of:—

**BARS, STRUCTURAL SECTIONS,
STRIP, SHEETS, PLATE, WIRE,
TUBE, FORGINGS AND CASTINGS**

Write for Booklet 59 on this subject.



The illustrations show a Chemical Pan made by Messrs. S. Briggs & Co., Ltd., of Burton-on-Trent, and two Budgets made by the Roto Engineering Co., Ltd., Bradford—all being made from Firth "Staybrite" Steel.

HEAT RESISTING STEELS

In addition to their Stainless Steels, Firth's have for many years produced successful **HEAT - RESISTING STEELS** for application where resistance to scaling combined with optimum strength at high temperature is required. Particulars of these steels will gladly be sent upon request.

THOS. FIRTH & SONS, LIMITED, SHEFFIELD

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

London Gazette, &c.

Company Winding Up Voluntarily

NEO CHEMICALS, LTD. (C.W.U.V., 17/3/28.) G. W. Roberts, Incorporated Accountant, 2, Guildhall Chambers, 31-34, Basinghall Street, London, E.C.2, appointed as liquidator, February 27. Meeting of creditors at liquidator's office, Tuesday, March 20, at 3 p.m. Creditors claims by April 20.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

RECORD STAINS, INKS AND DRESSINGS CO. (1925) LTD., Record Works, Devonshire Road, Eccles. (C.C., 17/3/28.) £11 16s. 3d. January 27.

LEEDS CHEMICAL CLEANING WORKS, LTD., Waterloo Mills, Bramley, Leeds. (C.C., 17/3/28.) £22 14s. 6d. January 25.

Deed of Arrangement

SMITH, Norman Dudley, trading as SMITH AND CO., Cater Dyeworks, and residing at Highfield Villas Heckmondwike, dyer. (D.A. 17/3/28.) Dated March 1, filed March 6. Trustee, T. R. Ineson, 24, Vance's Chambers, Cloth Hall Street, Huddersfield, I.A. Secured creditors, £1,000; liabilities unsecured, £5,563; assets, less secured claims, £675.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

BARTLEY AND SMITH, LTD. (late CELLONOID, LTD.), London, S.W., paint manufacturers. (M., 17/3/28.) Registered February 28, £1,500 debenture, to J. F. Field, Ardcairn, Albert Promenade, Halifax; general charge.

VAUGHAN (W. E.) AND CO., LTD., Cardiff, dyers. (M., 17/3/28.) Registered March 2, £10,000 debenture, to Branch Nominees, Ltd., 15, Bishopsgate, E.C.; charged on land at Cardiff, also general charge. *£7,668. November 30, 1926.

VICTORIA OIL AND REFINING CO., LTD., Strood. (M., 17/3/28.) Registered February 28, £8,200 debenture, to I. H. Wheatcroft, Highgate Lodge, West Hill, N.6; general charge. *£7,000. December 29, 1927.

YORKSHIRE COKING AND CHEMICAL CO., LTD., London, S.W. (M., 17/3/28.) Registered February 23, series of debentures for £30,000, present issue £26,595; general charge. *Nil. June 14, 1927.

New Companies Registered

J. ALLCOCK AND SONS, LTD. Registered March 10. Nom. capital, £4,000 in £1 shares. Manufacturers and merchants of all kinds of rubber substitutes, rubber reclaimers and chemical manufacturers, etc. Subscribers: J. Allcock, 899, Ashton New Road, Clayton, Manchester; J. Allcock, junr., "Weston," Droylsden Road, Appenshaw, Manchester.

WILLIAM BAILEY AND SON (WOLVERHAMPTON), LTD., 31, Queen Victoria Street, London. Registered March 10. Nom. capital, £10,000 in £1 shares. To acquire the business of chemical manufacturers carried on by William Bailey and Sons at Wolverhampton. Directors: R. H. Bailey, C. V. Bailey, W. H. Timmins.

THE BRITISH ACETATE SILK CORPORATION, LTD. Registered as a "public" company on March 13. Nom. capital, £2,700,000 in 2,557,500 ordinary shares of £1 each and 2,850,000 deferred shares of 1s. each. To acquire the undertaking and assets and all or any of the liabilities of the Bulmer Rayon Company, Ltd.; to acquire from Sir William Bulmer, Kt., certain plant, machinery, tools, stocks and stores for the manufacture of cellulose acetate, and artificial silk, certain applications for British patents covering inventions relating to the manufacture of cellulose acetate, certain processes for the manufacture of artificial silk, and also certain plans and specifications relating to plant and machinery for the manufacture of such acetate and silk; to adopt an agreement with Sir William Bulmer (providing for his employment as managing director for seven years), and two agreements with Smith, Bulmer and Company, Ltd., and to carry on the business of manufacturers of and dealers in artificial silk and other artificial fibres or filaments, whether manufactured from cellulose acetate, viscose, collodion, suprammonium, or any other substance or material; manufacturers of and dealers in non-inflammable film for cinematographic, photographic, and other purposes. Directors: Sir Wm. Bulmer (managing director) and others to be appointed by the subscribers.

MAGUIRES, LTD., 20, Dale Street, Hulme, Manchester. Registered March 7. Nom. capital, £500 in 450 preference shares of £1 each and 1,000 ordinary shares of 1s. each. To adopt an agreement with J. W. Ellis and to carry on the business of dealers in a printing ink reducer known as "Soap-lah," formerly carried on by him as W. H. Maguire and Son, at 20, Dale Street, Hulme, Manchester, and that of manufacturers of printing inks, gums, dextrine, glycerine, oils, paints, chemicals, etc. Directors: J. W. Ellis, H. W. Perritt, Miss D. P. Stanley.

THE UNION PAINT CORPORATION LTD., Albion Chambers, Bristol. Registered as a "private" company on March 12. Nom. capital, £12,020 in £1 shares (20 founders, 2,000 cumulative preference and 10,000 ordinary). Manufacturers, exporters and importers of and dealers in colours, paints, varnishes, lacquers, cellulose products and solvents, bituminous paints, enamels, shellac, gums, oil and dry colours, printing and lithographic inks, stains, colouring matters, etc. Directors: S. R. Hall, F. R. Rudman, C. Beavis, R. A. Hall, E. Parsons, H. J. G. Rudman, T. Taylor, and N. Wills.

Voluntary Liquidation of Chemical Engineering Co

THE statutory meeting of the creditors of Fell Anderson and Co., Ltd., chemical engineers, of 2a, Canning Chambers, South John Street, Liverpool, was held on Friday, March 9, at the Law Association Rooms, Liverpool. Mr. T. S. Fogg, the liquidator, reported that the ranking liabilities were £8,334 16s. 4d., all due to unsecured creditors. In addition there were fully secured creditors for £68 3s. 10d., holding securities valued at £400. The assets were estimated to realise £1,427 6s., and were subject to preferential claims of £63 17s., leaving net assets of £1,363 9s., or a deficiency of £6,971 17s. 4d. The company was registered in April, 1919, with a nominal capital of £10,000, divided into 5,000 ordinary and a similar number of cumulative preference shares, all of the face value of £1 each. There had been issued 3,750 ordinary and 1,700 preference shares. The shares were held by Messrs. Fell and Anderson. The present position was attributed to the losses on the trading, and bad debts. Recently creditors had been pressing, and there were three judgments outstanding. It was further stated that Newton Chambers and Co., Ltd., had presented a petition for the compulsory liquidation of the company. The petition was down for hearing in the Liverpool County Court on March 16.

No resolution was passed. The creditors include: Croydon Gas Co., £200; Newton Chambers and Co., Ltd., £1,412; and Southbank Chemical Co., £1,143.

